Appendix C
Drawings

DISPLAY NO. 1

ALTERNATE "A" - DO NOTHING
ALTERNATE "B" - REHAB EXISTING STRUCTURE

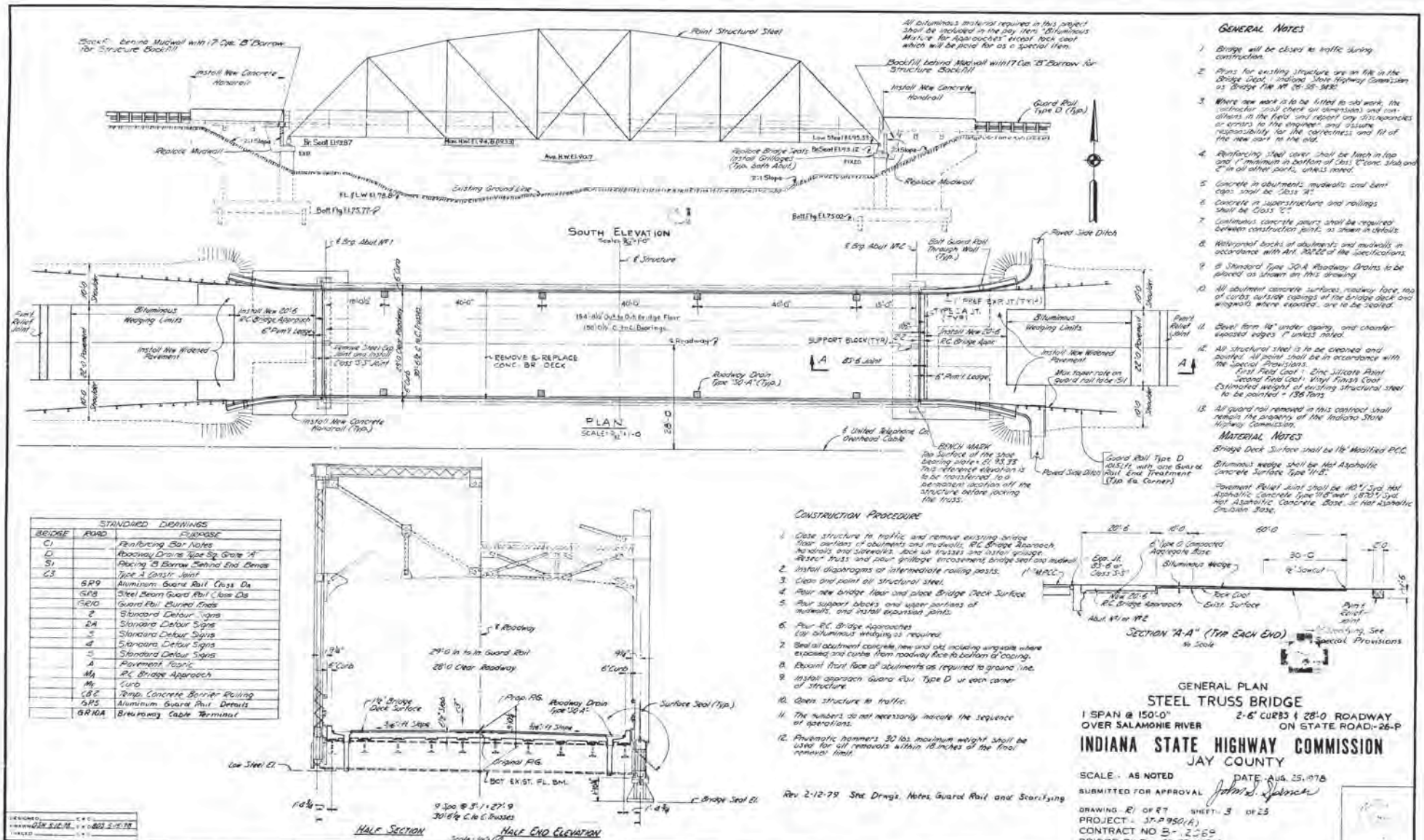
NOT FOR CONSTRUCTION

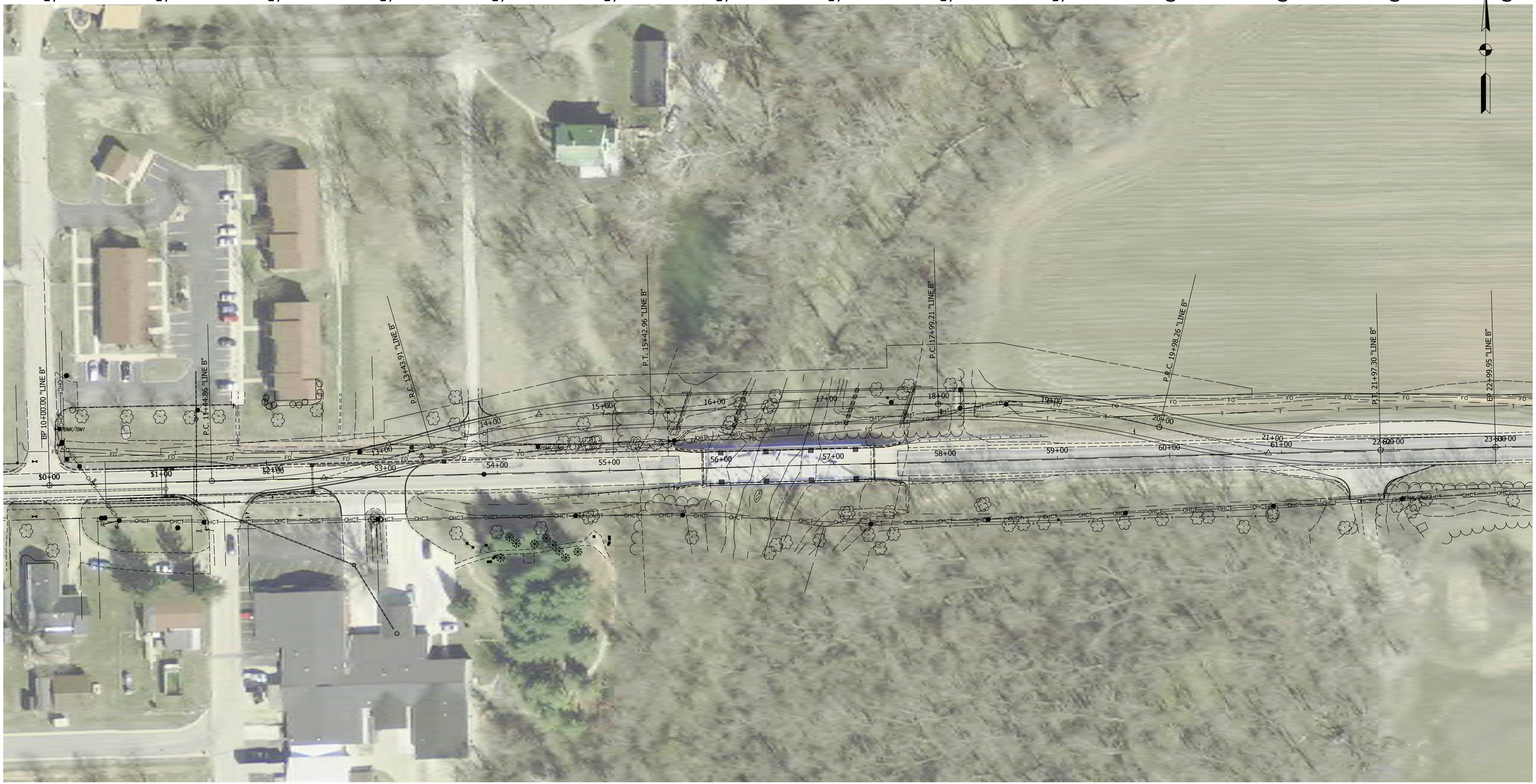
DESIGNED: BDC	DRAWN: BDC
CHECKED: BLM	CHECKED: BLM

INDIANA
DEPARTMENT OF TRANSPORTATION

ORIGINAL ALIGNMENT
LINE "A"

HORIZONTAL SCALE	BRIDGE FILE
1" = 40'-0"	026-38-03430 A
VERTICAL SCALE	DESIGNATION
NONE	####
SURVEY BOOK	SHEETS
####	#### of ####
CONTRACT	PROJECT
####	####


SOUTH ELEVATION
PLAN
HALF SECTION
HALF END ELEVATION
SECTION "A-A" (TYP EACH END)
GENERAL NOTES
1. Bridge will be closed to traffic during construction.
2. Plans for existing structure are on file in the Bridge Dept. Indiana State Highway Commission as Bridge File No. 26-38-3830.
3. Where new work is to be fitted to old work, the contractor shall check all dimensions and conditions in the field and report any discrepancies or errors to the engineer and assume responsibility for the correctness and fit of the new part to the old.
4. Reinforcing steel cover shall be 1inch in top and 1" minimum in bottom of Class 'C' conc. slab and 2" in all other parts, unless noted.
5. Concrete in abutments, wingwalls and bent caps shall be Class 'A'.
6. Concrete in superstructure and railings shall be Class 'S'.
7. Continuous concrete pours shall be required between construction joints, as shown in details.
8. Waterproof backs of abutments and wingwalls in accordance with Art. 702.12 of the Specifications.
9. 8 Standard Type 30-A Roadway Drains to be placed as shown on this drawing.
10. All abutment concrete surfaces, roadway face, top of curbs, outside copings of the bridge deck and wingwalls where exposed, are to be sealed.
11. Bevel form 1/2" under coping, and chamfer exposed edges 1" unless noted.
12. All structural steel is to be cleaned and painted. All paint shall be in accordance with the Special Provisions.
First Field Coat: Zinc Silicate Paint
Second Field Coat: Vinyl Finish Coat
Estimated weight of existing structural steel to be painted = 136 Tons
13. All guard rail removed in this contract shall remain the property of the Indiana State Highway Commission.
MATERIAL NOTES
Bridge Deck Surface shall be 1 1/2" Modified P.C.C.
Bituminous wedge shall be Hot Asphaltic Concrete Surface Type 'H-B'.
Pavement Relief Joint shall be 1/2" Syd. Hot Asphaltic Concrete Type 'H-B' over 1 1/2" Syd. Hot Asphaltic Concrete Base, or Hot Asphaltic Emulsion Base.
CONSTRUCTION PROCEDURE
1. Close structure to traffic and remove existing bridge floor portions of abutments and mudwalls, R.C. Bridge Approach, headrails and sidewalks. Jack up trusses and install grillage. Adjust truss and pour grillage encasement, bridge seat and mudwall.
2. Install diagonals or intermediate railing posts.
3. Clean and paint all structural steel.
4. Pour new bridge floor and place Bridge Deck Surface.
5. Pour support blocks and upper portions of mudwalls, and install expansion joints.
6. Pour R.C. Bridge Approaches (at bituminous wedging as required.
7. Seal all abutment concrete, new and old, including wingwalls where exposed, and curbs from roadway face to bottom of coping.
8. Repoint front face of abutments as required to ground line.
9. Install approach Guard Rail Type D at each corner of structure.
10. Open structure to traffic.
11. The numbers do not necessarily indicate the sequence of operations.
12. Pneumatic hammers 30 lbs. maximum weight shall be used for all removals within 18 inches of the final removal limit.
Rev. 2-12-79 Std. Drwgs. Notes, Guard Rail and Scarifying
STANDARD DRAWINGS
BRIDGE | ROAD | PURPOSE
C1 | | Reinforcing Bar Notes
D | | Roadway Drains Type 'B' Grate 'A'
S1 | | Placing 'B' Borrow Behind End Bents
C3 | | Type 'A' Constr. Joint
| GR9 | Aluminum Guard Rail Class 'D'
| GR8 | Steel Beam Guard Rail Class 'D'
| GR10 | Guard Rail Buried Ends
| 2 | Standard Detour Signs
| 2A | Standard Detour Signs
| 3 | Standard Detour Signs
| 4 | Standard Detour Signs
| 5 | Standard Detour Signs
| A | Pavement Fabric
| MA | R.C. Bridge Approach
| Mc | Curb
| CBC | Temp. Concrete Barrier Rolling
| GR5 | Aluminum Guard Rail Details
| GR10A | Breakaway Cable Terminal
GENERAL PLAN
STEEL TRUSS BRIDGE
1 SPAN @ 150'-0" OVER SALAMONIE RIVER
2-6" CURBS & 28'-0 ROADWAY ON STATE ROAD:-26-P
INDIANA STATE HIGHWAY COMMISSION
JAY COUNTY
SCALE:- AS NOTED
DATE:-AUG. 25, 1978
SUBMITTED FOR APPROVAL
DRAWING 21 OF 87 SHEETS 3 OF 25
PROJECT:- 37-P 950(A)
CONTRACT NO 3-2269
BRIDGE FILE:- 26-38-3830A



DISPLAY NO. 2

ALTERNATE "C" - ONE-WAY PAIRS (SIMILAR)
ALTERNATE "D" - TWO-WAY BYPASS (SHOWN)

NOT FOR CONSTRUCTION

DESIGNED: _____ DRAWN: _____

CHECKED: _____ CHECKED: _____

INDIANA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 26

HORIZONTAL SCALE	BRIDGE FILE
1" = 40'	
VERTICAL SCALE	DESIGNATION
N/A	

SURVEY BOOK	SHEETS
	---- of
CONTRACT	PROJECT

DISPLAY NO. 3

ALTERNATE "E & F" - STRUCTURE REPLACEMENT WITH NO CHANGE TO ALIGNMENT

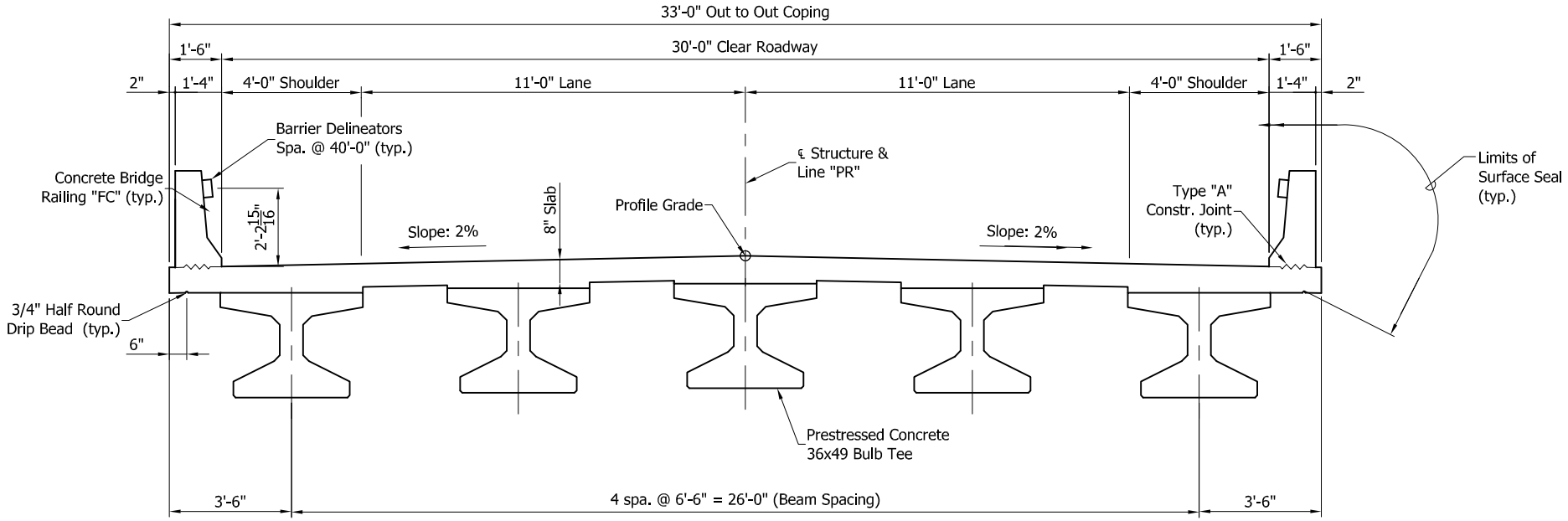
NOT FOR CONSTRUCTION

DESIGNED: BDC	DRAWN: BDC
CHECKED: BLM	CHECKED: BLM

INDIANA
DEPARTMENT OF TRANSPORTATION

ORIGINAL ALIGNMENT
LINE "A"

HORIZONTAL SCALE	BRIDGE FILE
1" = 40'-0"	026-38-03430 A
VERTICAL SCALE	DESIGNATION
NONE	####
SURVEY BOOK	SHEETS
####	#### of ####
CONTRACT	PROJECT
####	####



ALTERNATIVE "D", "E" AND "F"
TYPICAL SECTION

Scale: 3/8"=1'-0"

Appendix D
Cost Estimates and Quantities

PRICING REPORT

Date: 11/18/2019
Time: 03:09:19

Project: ***Alternate B***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102***
Bid Date: ***/ /***
State: ***IN***
Route:

Project Settings

Primary County:	JAY	Urban/Rural:	
Addl Counties:		Work Type:	
District:	Fort Wayne	Function Class:	
Longitude:	89° 00' 00"	Season:	
Latitude:	35° 00' 00"	Estimator:	mfitzpatrick
Log Mile:	Beg:	Constr Eng:	0.00 %
	End:	Priced Date:	/ /
Station:	Beg:	Create Date:	03/26/2018
	End:	Fed Projec No:	2017-102
Project Length:	0.0000 miles		

Project Categories

100	Category 100	465,000.00	48.3%
200	Category 200	103,458.00	10.8%
300	Category 300	3,120.00	0.3%
400	Category 400	4,306.40	0.4%
600	Category 600	45,061.16	4.7%
700	Category 700	303,701.06	31.6%
0	Category 0	37,640.00	3.9%
TOTALS:		**962,286.62**	**100.0%**

Major Categories

MISC.	618,519.16	64.3%
GRADE/DRAIN	0.00	0.0%
BRIDGE	336,341.06	35.0%
PAVEMENT/BASE	7,426.40	0.8%
TOTALS:	**962,286.62**	**100.0%**

Project: ***Alternate B***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102***
Bid Date: ***/ /***
Route:

State: ***IN***

SortCd	Sect	Pay Item	Description	Quantity	Unit	Bid Price	Extension	Alt
1	100	105-06807	additional {clean and paint}	1.000	L.S.	400,000.00	400,000.00	
2	100	105-06845	construction engineering	1.000	L.S.	19,000.00	19,000.00	
3	100	110-07025	mobilization and demobilization	1.000	EACH	46,000.00	46,000.00	
		CATEGORY 100 SUBTOTALS					**465,000.00** **48.3%**	
4	200	202-02240	pavement removal	133.000	SYS	26.00	3,458.00	
5	200	202-51328	present structure, remove portions	1.000	L.S.	100,000.00	100,000.00	
		CATEGORY 200 SUBTOTALS					**103,458.00** **10.8%**	
6	300	306-08159	milling, asphalt {hma}	480.000	SYS	6.50	3,120.00	
		CATEGORY 300 SUBTOTALS					**3,120.00** **0.3%**	
7	400	401-07321	qc/qa-hma, 2, 64, surface, 9.5 mm	40.000	TON	107.66	4,306.40	
		CATEGORY 400 SUBTOTALS					**4,306.40** **0.4%**	
8	600	601-01522	guardrail, transition, type tgb	4.000	EACH	2,343.00	9,372.00	
9	600	601-01700	guardrail, terminal system, w-beam curved, 1	1.000	EACH	2,201.50	2,201.50	
10	600	601-12281	guardrail mgs w-beam, 6 ft 3 in spacing	450.000	L.F.	20.27	9,121.50	
11	600	601-94689	guardrail, end treatment, os	3.000	EACH	2,779.00	8,337.00	
12	600	609-06259	reinforced concrete bridge approach, 12 in.	133.000	SYS	120.52	16,029.16	
		CATEGORY 600 SUBTOTALS					**45,061.16** **4.7%**	
13	700	703-06029	reinforcing bars, epoxy coated	41,937.000	LBS	1.00	41,937.00	
14	700	704-51002	concrete, c, superstructure	110.800	C.Y.	920.70	102,013.56	
15	700	706-11620	concrete bridge railing transition, tfc	4.000	EACH	1,861.50	7,446.00	
		CATEGORY 700 SUBTOTALS					**303,701.06** **31.6%**	
16	0	706-51020	railing, concrete c	29.600	C.Y.	900.00	26,640.00	

Project: ***Alternate B***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102***
Bid Date: ***/ /***
Route:

State: ***IN***

SortCd	Sect	Pay Item	Description	Quantity	Unit	Bid Price	Extension	Alt
17	0	709-51821	surface seal	1.000	L.S.	6,000.00	6,000.00	
		CATEGORY 0 SUBTOTALS					**37,640.00** **3.9%**	
18	700	710-09158	patching concrete structures	250.000	S.F.	137.25	34,312.50	
19	700	711-51038	structural steel	1.000	L.S.	65,000.00	65,000.00	
20	700	711-93035	jacking and supporting, structural steel {lsum}	1.000	L.S.	40,000.00	40,000.00	
21	700	724-51925	structural expansion joint, ss	58.000	L.F.	224.00	12,992.00	
		CATEGORY 700 SUBTOTALS					**303,701.06** **31.6%**	
22	0	801-06775	maintaining traffic	1.000	L.S.	5,000.00	5,000.00	
		CATEGORY 0 SUBTOTALS					**37,640.00** **3.9%**	
		TOTALS					**962,286.62** **100.0%**	

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Indianapolis, Indiana 46216
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Initials DNB Date 3-26-18 Sheet No ___ of ___
Chkd by [illegible] Date 3-26-18 Job No. 2017-10
Subject Alt. B
SR 26 over Salamonie

Pavement Removal

29' x 20'-6" x 1/9 x 2 = **133 Sys**

RC. Bridge Approach

29' x 20'-6" x 1/9 x 2 = **133 Sys**

Epoxy Coated Reinforcing Steel

Class "C" 110.8 Cys x 425#/Cys = 24,930 Lbs
Appr. slabs 133 Sys x 50#/Syd = 6650 Lbs
Barrier 310 Lft x 26.3 Lbs/Lft = 8153 Lbs.
Transitions 551 Lbs x 4 = 2204 Lbs

total = **41,937 Lbs**

HmA transition milling

90' x 24' x 1/9 x 2 = **480 Sys**

QC-QA-HMA, 2, 64, Surface, 9.5 mm

90' x 24' x 1/9 x 165#/Syd x 1/2000 x 2 = **40 tons**

Expansion Joint Class "SS"

29 Lft x 2 = **58 Lft**

Concrete Class "C" in Railing

310 Lft x 2.58 Cft/Lft x 1/27 = **29.6 Cys**

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Initials DWB Date 3-26-18 Sheet No ___ of ___
Chkd by KM Date 3-26-18 Job No 2017-102
Subject Alt. B

Guardrail, MGS, W-Beam, 6'3" Post Spa.

NW	100 Lft	
NE	125 Lft	
SW	100 Lft	
SE	125 Lft	Total 450 Lft

Guardrail, MGS, Curved W-Beam, Terminal System Type 1

1 Each

Guardrail End treatment, Type "OS" 3 Each

Concrete Bridge Railing Transition, TFC 4 Each

Guardrail transition, MGS, TGB 4 Each

Concrete Class "C" in Superstructure

154'-9" x 29' x 8" x 1/27 = 110.8 Cys

Remove Structure, Portions use $100,000 1 LSum

Patching Concrete Structures 250 sft

Surface Seal (154'9" x 31') + (29' x 20.5 x 2) = 5987 sft

USI Consultants
Engineers & land surveyors
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Fax: 317-544-4997

Initials DWB Date 3/26/18 Sheet No ___ of ___
Chkd by BLM Date 3-26-18 Job No 2017-102
Subject ALT B

Structural Steel

Lower Chord

L0-L2, L5-L6 W10x54

40' x 2 x 54 plf = 4,320 lb

Stringers – Assume Replace 15

23' x 50 plf x 15 = 17,250 lb

Gusset PL at L3

3' x 3' x 3/8" x 490 pcf 140 lb

Bridge Rail 800 #/Panel x 7 panels x 2 trusses x 0.15 1680 lb

23,390 lb

Misc ≈ 10% 2339

25,729 lb

2,500

$64,323

Use $65,000

Structural Steel 1 LSUM

Jack & Support (1 LSUM

Clean & Paint (Use $400,000) 1 LSUM

(includes collection and disposal of waste)

PRICING REPORT

Date: 08/21/2018
Time: 10:17:01

Project: ***Alternate C&D***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102 ALT C&D***
Bid Date: ***/ /*** State: ***IN***
Route: ***SR 26***

Project Settings

Primary County:	JAY	Urban/Rural:	
Addl Counties:		Work Type:	
District:	Fort Wayne	Function Class:	
Longitude:	89° 00' 00"	Season:	
Latitude:	35° 00' 00"	Estimator:	Martin K. Teufel, EI
Log Mile:	Beg:	Constr Eng:	0.00 %
	End:	Priced Date:	/ /
Station:	Beg:	Create Date:	03/26/2018
	End:	Fed Projec No:	2017-102
Project Length:	0.0000 miles		

Project Categories

100 General Provisions	78,500.00	5.8%
200 Earthwork	219,190.00	16.3%
300 Aggregate Pavement and Bases	33,440.00	2.5%
400 Asphalt Pavement	64,070.00	4.8%
600 Incidental Construction	78,912.00	5.9%
700 Structures	868,770.50	64.7%
TOTALS:	**1,342,882.50**	**100.0%**

Major Categories

MISC.	292,412.00	21.8%
GRADE/DRAIN	84,190.00	6.3%
BRIDGE	868,770.50	64.7%
PAVEMENT/BASE	97,510.00	7.3%
TOTALS:	**1,342,882.50**	**100.0%**

STIP Information

Construction Cost	1,342,882.50	100.0%
PE	0.00	0.0%
CE	0.00	0.0%
R/W	0.00	0.0%
R/W Incidentals	0.00	0.0%
Utilities	0.00	0.0%
Incentive	0.00	0.0%
TOTAL:	**1,342,882.50**	**100.0%**

Project: ***Alternate C&D***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102 ALT C&D***
Bid Date: ***/ /*** State: ***IN***
Route: ***SR 26***

Sect	Pay Item	Description	Quantity	Unit	Bid Price	Extension	Alt
100	105-06845	construction engineering	1.000	L.S.	22,500.00	22,500.00	
100	110-01001	mobilization and demobilization	1.000	L.S.	56,000.00	56,000.00	
		GENERAL PROVISIONS SUBTOTALS				**78,500.00** **5.8%**	
200	201-52370	clearing right of way	1.000	L.S.	10,000.00	10,000.00	
200	202-51330	present structure, remove	1.000	L.S.	125,000.00	125,000.00	
200	203-02000	excavation, common	1,010.000	C.Y.	25.00	25,250.00	
200	203-02070	borrow	2,947.000	C.Y.	20.00	58,940.00	
		EARTHWORK SUBTOTALS				**219,190.00** **16.3%**	
300	301-12234	compacted aggregate no 53	608.000	C.Y.	55.00	33,440.00	
		AGGREGATE PAVEMENT AND BASES SUBTOTALS				**33,440.00** **2.5%**	
400	401-07321	qc/qa-hma, 2, 64, surface, 9.5 mm	220.000	TON	110.00	24,200.00	
400	401-07390	qc/qa-hma, 2, 64, intermediate, 19.0 mm	443.000	TON	90.00	39,870.00	
		ASPHALT PAVEMENT SUBTOTALS				**64,070.00** **4.8%**	
600	601-01522	guardrail, transition, type tgb	4.000	EACH	2,400.00	9,600.00	
600	601-01700	guardrail, terminal system, w-beam curved, 1	1.000	EACH	2,200.00	2,200.00	
600	601-12281	guardrail mgs w-beam, 6 ft 3 in spacing	450.000	L.F.	20.00	9,000.00	
600	601-94689	guardrail, end treatment, os	3.000	EACH	2,800.00	8,400.00	
600	609-06259	reinforced concrete bridge approach, 12 in.	162.600	SYS	120.00	19,512.00	
600	616-06405	riprap, revetment	600.000	TON	45.00	27,000.00	
600	616-12248	geotextile for riprap type 2a	800.000	SYS	4.00	3,200.00	
		INCIDENTAL CONSTRUCTION SUBTOTALS				**78,912.00** **5.9%**	
700	701-09675	pile, steel pipe, epoxy coated, 0.312 in., 14 in.	700.000	L.F.	160.00	112,000.00	

Project: ***Alternate C&D***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102 ALT C&D***
Bid Date: ***/ /*** State: ***IN***
Route: ***SR 26***

Sect	Pay Item	Description	Quantity	Unit	Bid Price	Extension	Alt
700	702-51005	concrete, a, substructure	98.500	C.Y.	1,000.00	98,500.00	
700	703-06029	reinforcing bars, epoxy coated	75,308.000	LBS	1.00	75,308.00	
700	704-51002	concrete, c, superstructure	232.900	C.Y.	925.00	215,432.50	
700	706-09960	railing, concrete fc	404.000	L.F.	70.00	28,280.00	
700	706-11620	concrete bridge railing transition, tfc	4.000	EACH	1,900.00	7,600.00	
700	707-09865	structural member, concrete, bulb-t beam, 36 in. x 49 in.	1,005.000	L.F.	330.00	331,650.00	
		STRUCTURES SUBTOTALS				**868,770.50** **64.7%**	
		TOTALS				**1,342,882.50** **100.0%**	

OFFICE
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Initials BDC Date 3/23/18 Sheet No 3 of ___
Chkd by BLM Date 3/27/18 Job No. ___
Subject ALT. ~~A~~ CHD

ALT ~~A~~ CHD

QC-QA-HmA, 2, 64, Surface, 9.5 mm

995.53 ~~450~~' x 24' x 1/9 x 165#/syd x 1/2000 = ~~219 Tons~~ 220 Tons

QC-QA-HmA, 2, 64, Intermediate, 19.0 mm

995.53 ~~450~~' x 24' x 1/9 x 330#/syd x 1/2000 x 1.01 = ~~200 Tons~~ 443 Tons

Compacted Aggregate Base, No. 53

995.53 ~~450~~' x 24' x 8" x 1/27 x 1.03 = ~~215 Cys~~ 608 Cys

Revetment Riprap Estimated 600 Tons

Geotextiles for Riprap Type 2A Estimated 600 Sys

~~Existing Structure Removal~~ 1 LSum

Earthwork Summary

Common Excavation 1010 Cys

Fill + 20% 3297 Cys x 1.2 = 3957 Cys

Borrow 3957 Cys - 1010 Cys = 2947 Cys

USI Consultants
engineers & land surveyors
OFFICE
Indiana
8415 East 56th Street
Indianapolis, Indiana 46216
Phone: 317-544-4996
Fax: 317-544-4997

Initials BDC Date 3/23/18 Sheet No. 1 of
Chkd by BCM Date 3/26/18 Job No. 2017-10:
Subject ALT ~~F~~ C&D
2 LANE BRIDGE REPLACEMENT

ALT. ~~F~~ C&D

PRESTRESSED CONCRETE 36x49 BULB-TEE

50.667' x 5 x 2 = 507'
99.667' x 5 = 498'
1,005 LFT

CONCRETE CLASS "C" SUPERSTRUCTURE

DECK 6666 sft x 8" x 1/27 = 164.6 CYS
END BENT 115.5 sft x 5' x 1/27 x 2 = 42.8 CYS
FILLETS 4.083x 202.0' x 2" x 1/27 x 5 = 25.5 CYS
total = 232.9 CYS

CONCRETE CLASS "A" IN SUBSTRUCTURE

PIER CAP = 102 sft x 3' x 1/27 x 2 = 22.7 CYS
PIER STEM: 68 sft x 12' x 1/27 = 30.2 CYS
68 sft x 15' x 1/27 = 37.8 CYS
MUDSILL = 35' x 3' x 1' x 1/27 x 2 = 7.8 CYS
total = 98.5 CYS

R.C. BRIDGE APPROACH, 12"

732 sft x 1/9 = 81.3 SYS x 2 = 162.6 SYS

EPOXY COATED REINFORCING STEEL

CLASS "C" 232.9 CYS x 225 #/CYD = 52,403 LBS
CLASS "A" 98.5 CYS x 150 #/CYD = 14,775 LBS
APPROACH SLABS 162.6 SYS x 50 #/SYS = 8,130 LBS
totals 75,308 LBS

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Initials BDC Date 3/23/18 Sheet No 2 of
Chkd by RLM Date 3/27/18 Job No. 2017-10
Subject ALT # C&D

ALT # C&D

14" Ø SEC PILES

Abut's = 7 x 25' x 2 = 350 LFT

Pier's = 7 x 25' x 2 = 350 LFT

totals 700 LFT

FC RAILING

202' x 2 = 404 LFT

TFC RAILING TRANSITION

4 EACH

GUARDRAIL TRANSITION MGS, TCB

4 EACH

GUARDRAIL MGS W-BEAM, 6FT 3IN SPACING

NW QUAD = 100 LFT
NE QUAD = 125 LFT
SW QUAD = 100 LFT
SE QUAD = 125 LFT

totals 450 LFT

GUARDRAIL, MGS, Curved W-Beam, Terminal System Type I

1 EACH

GUARDRAIL END TREATMENT TYPE "OS"

3 EACH

PRICING REPORT

Date: 08/21/2018
Time: 10:17:58

Project: ***Alternate E&F***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102 ALT E&F***
Bid Date: ***/ /*** State: ***IN***
Route:

Project Settings

Primary County:	JAY	Urban/Rural:	
Addl Counties:		Work Type:	
District:	Fort Wayne	Function Class:	
Longitude:	89° 00' 00"	Season:	
Latitude:	35° 00' 00"	Estimator:	mfitzpatrick
Log Mile:	Beg:	Constr Eng:	0.00 %
	End:	Priced Date:	/ /
Station:	Beg:	Create Date:	03/26/2018
	End:	Fed Projec No:	2017-102
Project Length:	0.0000 miles		

Project Categories

100	General Provisions	81,000.00	7.0%
200	Earthwork	148,000.00	12.8%
300	Aggregate Pavement and Bases	3,600.00	0.3%
400	Asphalt Pavement	4,320.00	0.4%
600	Incidental Construction	77,624.50	6.7%
700	Structures	843,754.00	72.8%
TOTALS:		**1,158,298.50**	**100.0%**

Major Categories

MISC.	306,624.50	26.5%
GRADE/DRAIN	0.00	0.0%
BRIDGE	843,754.00	72.8%
PAVEMENT/BASE	7,920.00	0.7%
TOTALS:	**1,158,298.50**	**100.0%**

Project: ***Alternate E&F***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102 ALT E&F***
Bid Date: **/ /** State: ***IN***
Route:

Sect	Pay Item	Description	Quantity	Unit	Bid Price	Extension	Alt
100	105-06845	construction engineering	1.000	L.S.	23,000.00	23,000.00	
100	110-01001	mobilization and demobilization	1.000	L.S.	58,000.00	58,000.00	
		GENERAL PROVISIONS SUBTOTALS				**81,000.00** **7.0%**	
200	201-52370	clearing right of way	1.000	L.S.	23,000.00	23,000.00	
200	202-51330	present structure, remove	1.000	L.S.	125,000.00	125,000.00	
		EARTHWORK SUBTOTALS				**148,000.00** **12.8%**	
300	306-08043	milling, transition	480.000	SYS	7.50	3,600.00	
		AGGREGATE PAVEMENT AND BASES SUBTOTALS				**3,600.00** **0.3%**	
400	401-07321	qc/qa-hma, 2, 64, surface, 9.5 mm	40.000	TON	108.00	4,320.00	
		ASPHALT PAVEMENT SUBTOTALS				**4,320.00** **0.4%**	
600	601-01522	guardrail, transition, type tgb	4.000	EACH	2,350.00	9,400.00	
600	601-01700	guardrail, terminal system, w-beam curved, 1	1.000	EACH	2,200.00	2,200.00	
600	601-12281	guardrail mgs w-beam, 6 ft 3 in spacing	450.000	L.F.	20.25	9,112.50	
600	601-94689	guardrail, end treatment, os	3.000	EACH	2,800.00	8,400.00	
600	609-06259	reinforced concrete bridge approach, 12 in.	162.600	SYS	120.00	19,512.00	
600	616-06405	riprap, revetment	600.000	TON	43.00	25,800.00	
600	616-12248	geotextile for riprap type 2a	800.000	SYS	4.00	3,200.00	
		INCIDENTAL CONSTRUCTION SUBTOTALS				**77,624.50** **6.7%**	
700	701-09675	pile, steel pipe, epoxy coated, 0.312 in., 14 in.	960.000	L.F.	160.00	153,600.00	
700	702-51005	concrete, a, substructure	98.500	C.Y.	1,000.00	98,500.00	
700	703-06029	reinforcing bars, epoxy coated	76,364.000	LBS	1.00	76,364.00	
700	704-51002	concrete, c, superstructure	227.800	C.Y.	920.00	209,576.00	

Project: ***Alternate E&F***
Location: ***SR 26 over Salamonie River***
County: ***JAY***
District: ***Fort Wayne***

Project ID: ***2017-102 ALT E&F***
Bid Date: ***/ /*** State: ***IN***
Route:

Sect	Pay Item	Description	Quantity	Unit	Bid Price	Extension	Alt
700	706-09960	railing, concrete fc	404.000	L.F.	70.00	28,280.00	
700	706-11620	concrete bridge railing transition, tfc	4.000	EACH	1,900.00	7,600.00	
700	707-09865	structural member, concrete, bulb-t beam, 36 in. x 49 in.	804.000	L.F.	325.00	261,300.00	
700	709-51821	surface seal	1.000	L.S.	8,534.00	8,534.00	
		STRUCTURES SUBTOTALS				**843,754.00** **72.8%**	
		TOTALS				**1,158,298.50** **100.0%**	

OFFICE
Indiana
8415 East 56th Street
Indianapolis, Indiana 46216
Phone: 317-544-4996
Fax: 317-544-4997

ALT. F&E

Initials BDC Date 3/23/18 Sheet No 1 of
Chkd by BLM Date 3/26/18 Job No. 2017-102
Subject ALT F&E
2 LANE BRIDGE REPLACEMENT

PRESTRESSED CONCRETE 36x49 BULB-TEE

50.667' x 4 x 2 = 405.33'
99.667' x 4 = 398.67'

total = **804 Lft**

CONCRETE CLASS "C" SUPERSTRUCTURE

DECK 6666 sft x 8" x 1/27 = 164.6 CYS

END BENT 115.5 sft x 5' x 1/27 x 2 = 42.8 CYS

FILLETS 4.083% 202.0' x 2" x 1/27 x 4 = 20.4 CYS

total = **227.8 CYS**

CONCRETE CLASS "A" IN SUBSTRUCTURE

PIER CAP = 102 sft x 3' x 1/27 x 2 = 22.7 CYS

PIER STEM: 68 sft x 12' x 1/27 = 30.2 CYS
68 sft x 15' x 1/27 = 37.8 CYS

MUDSILL = 35' x 3' x 1' x 1/27 x 2 = 7.8 CYS

total = **98.5 CYS**

R.C. BRIDGE APPROACH, 12"

732 sft x 1/9 = 81.3 SYS x 2 = **162.6 SYS**

EPOXY COATED REINFORCING STEEL

CLASS "C" 227.8 CYS x 225 #/CYD = 51,255 Lbs

CLASS "A" 98.5 CYS x 150 #/CYD = 14,775 LBS

APPROACH SLABS 162.6 SYS x 50 #/SYS = 8,130 LBS

Transitions 4 x 551 Lbs = 2204 Lbs

total = **76,364 Lbs**

OFFICE
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Initials BDC Date 3/23/18 Sheet No 3 of ____
Chkd by BLM Date 3/26/18 Job No. ____
Subject ALT. F & E

ALT F & E

QC-QA-HmA, 2, 64, Surface, 9.5 mm

(90' x 2) x 24' x 1/9 x 165#/syd x 1/2000 = 40 Tons

~~QC-QA-HmA, 2, 64, Intermediate, 19.0 mm~~

~~450' x 24' x 1/9 x 330#/syd x 1/2000 x 1.01 = 200 Tons~~

~~Compacted Aggregate Base, No. 53~~

~~450 x 24' x 8" x 1/27 x 1.03 = 275 sys~~

Revetment Riprap Estimated 600 Tons

Geotextiles for Riprap Type 2A Estimated 800 Sys

Existing Structure, Remove use $125,000 1 LSum

Transition milling

90' x 24' x 1/9 x 2 = 480 Sys

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Initials BDC Date 3/23/18 Sheet No 2 of ___
Chkd by BLM Date 3/26/18 Job No. 2017-102
Subject ALT F & E

ALT F&E

14"Ø SEC PILES

Abut's = 6 x 40' x 2 = 480 LFT
PIER'S = 6 x 40' x 2 = 480 LFT
totals **960 LFT**

FC RAILING

202' x 2 = **404 LFT**

TFC RAILING TRANSITION

4 EACH

GUARDRAIL TRANSITION MGS, TGB

4 EACH

GUARDRAIL MGS W-BEAM, 6FT 3IN SPACING

NW QUAD = 100 LFT
NE QUAD = 125 LFT
SW QUAD = 100 LFT
SE QUAD = 125 LFT
totals **450 LFT**

GUARDRAIL, MGS, Curved W-Beam, Terminal System Type I

1 EACH

GUARDRAIL END TREATMENT TYPE "OS"

3 EACH

Surface Seal

Deck 202' x 35' = 7070 sft
Appr. Slab 732 sft x 2 = 1464 sft
total = **8534 sft**

Appendix E
SI&A Report

Bridge Inspection Report

026-38-03430 A

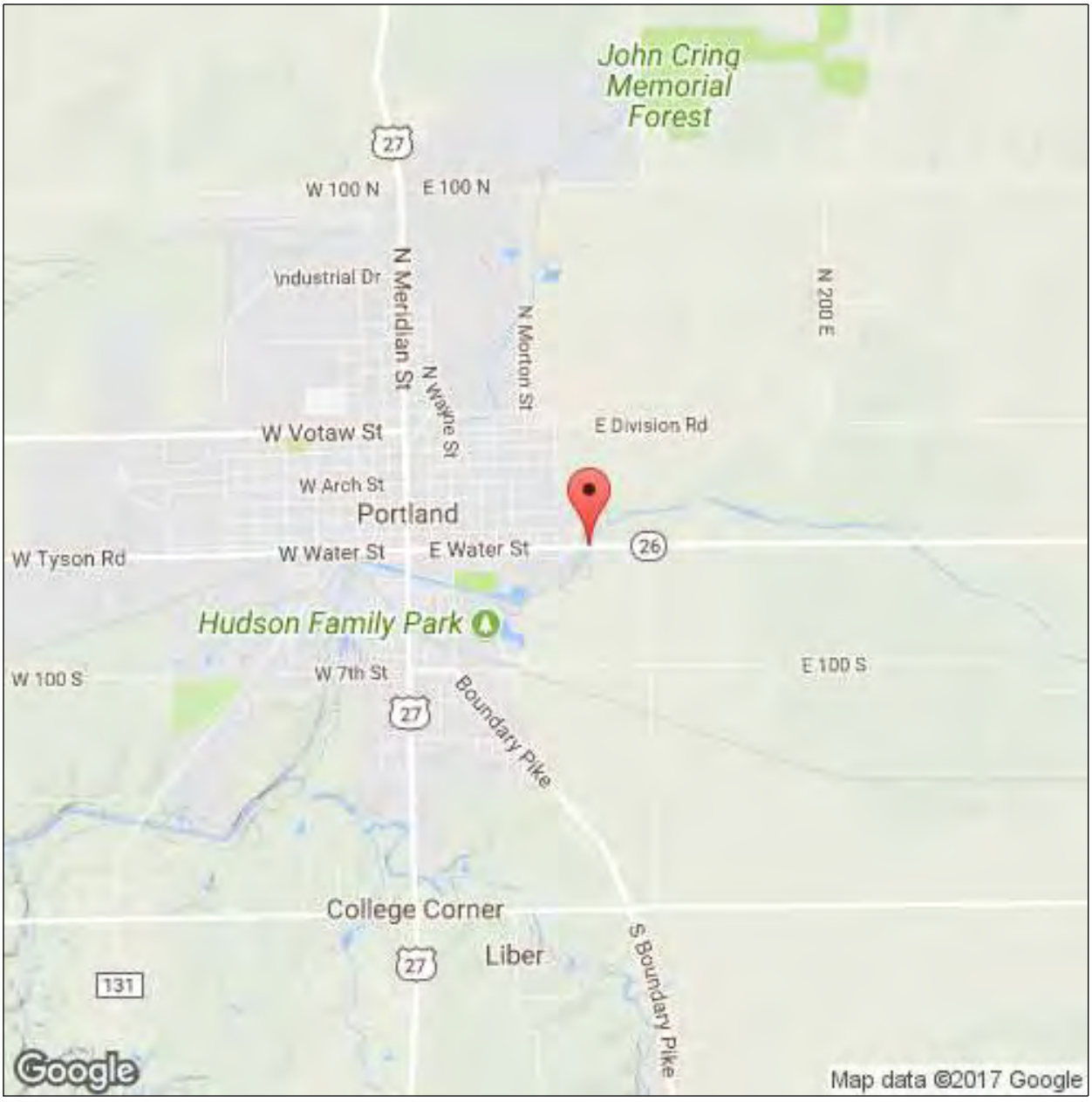
SR 26
over
SALAMONIE RIVER

Inspection Date: 08/30/2017

Inspected By: Bonnie L. Money

Inspection Type(s): Fracture Critical

TABLE OF CONTENTS



Latitude: 40.43255

Longitude: -84.963486

SR 26 over Salamonie River (RP 141+23)

7-panel, Pratt (Camel-back) through-truss. Built in 1941, under contract B-2144. 'A' Rehab (replaced deck - built with 1.5" bridge deck surface) in 1979, B-12069.

Historical Bridge: "Non-Select"

Channel: the Salamonie River flows from north to south under the bridge.

Orientation ---
Abutment #1 is at the West End.

North Truss is the "Y" Truss on the Design Plans - panel points are numbered from west to east, with L0 at the west end.

South Truss is the "X" Truss on the Design Plans - panel points are numbered from east to west, with L0 at the east end.

Floor Beam #1 is at the West end of the deck.
Stringer #1 is at the South edge of the deck, in each panel.

Last Fracture Critical Inspection: conducted on 8-27-2015, using the UB-40.

Programmed Work:suspended contract for painting with a RFL date of 08/10/2016, DES # 1383052, Contract B-36498. It was last painted in 2000, under Contract M-24790, (3-coat system, blue, 136.1 tons).

Future Work: scheduled for replacement in 2021 (B-39818; Des. 1600828); Letting Date of 09/02/2020;

Roadway: new HMA on west end; chip & seal over HMA on east end; Good Condition;

Guardrail: twin-tube aluminum system on all four corners; Fair Condition;

West Approach: grooves from milling machine on surface at west end; chipping along 1A joint; wide, irregular crack along center line, with spall near 1A joint; spall on curb in SE corner;

West Joint: S-S joint; seal is intact; filled with debris;

East Joint: BS seal; adjacent concrete has lots of chipping; debris impaction of seal; ineffective;

East Approach: similar to west approach;

*** Select Notes from 2016 Routine Inspection ***

West portal has collision damage above EBL. Used binoculars to look at area from deck. No cracks noted. Channel is bent inward, with yellow paint noted on member; peeling paint on back side of bend.

*** Notes from 2015 Routine Inspection ***

Stringers:

Section loss to flanges & webs of outside stringers in the end panels - esp. heavy @ corners - bottom flange SW has a 1" wide area of section loss - remaining steel tapers down to paper thin @ edge; holes thru webs of outside stringers @ corners: 3"x3"- SW & 1"x10"- SE; minor pitting & section loss to N. stringer in bay #2 from the East; Stringer #2 from the north on E. side of floor beam #4 - top flange damaged/torn down @ coped area (~2" tear).

Possible crack at the upper cope, at the east end of the north coping stringer, on the west side of the Floor Beam at L1, north truss, under the curb line. There is rust staining on the stringer that may indicate a crack, that may be +- 2" long. Will need to use the UB-40 to verify this. (This is NOT a Critical Finding).

Floor Beams:

Bottom flange has 1/4" section loss in bottom flange thickness (typical 1 1/8" thick now 7/8" for a 2" wide x 3" long area along the edge of the gusset plate - L3 of N. truss; Corrosion “hot spots” on top of bottom flange of floor beam #4 - 1/8” max. depth @ 1”x1” & 2”x2” areas on W. side, near the S. truss; Floor beam # 5 – moderate section loss @ bottom flange & web pitting near N. truss, minor section loss at edge of gusset @ S. truss; Floor beams #2 & 3 near N. truss – bottom flanges have areas of pitting (1/8” max. depth).

Verticals:

U4L4 of North truss - corrosion holes through outside channel ~ level with the deck - 1" & 2" diameter;

U2L2 of South truss - minor corrosion & pitting @ railing connection, 1 minor collision scrape - NW corner ~18" above railing;

U3L3 & U5L5 of South truss - lacing has minor corrosion on lower half of verticals;

U4L4 of South truss, U3L3 & U4L4 of North truss - minor pack rust between sway frame angles & verticals.

Diagonals:

NW & SE end posts have corrosion, pitting & minor section loss on the inside face of the outside channel sections.

U1L2 of North truss - 3 rivets have heavy corrosion & section loss bottom end on E. face;

U3L4 of North truss - outside flange has minor hot spots of corrosion on the bottom side;

U1L2 of South truss - hot spots of corrosion in the flange & web near lower chord & behind the railing - minor section loss heavier near lower chord;

U3L4 of South truss - 3 rivets have heavy corrosion & section loss on the outside flange;

U4L3 of South truss - ~4' long area of minor mill scale rusting near the bottom on the inside face of the outside flange.

Lower Chords:

Corrosion & section loss to lower chord splice plates (1/4” max. edge loss) - N. truss near L4 and S. truss near L2 & L4;

Pitting areas with minor section loss painted over are typical;

L0L1 of North truss - minor corrosion @ E. end top of web & flanges;

L1L2 of North truss - some pitting 1/8" deep, 1 small spot with corrosion inside flange near L2;

L2L3 of North truss- few small spots of pitting & section loss up to 1/8" deep on inside faces @ L3;

L6L7 of North truss - corrosion, pitting & minor section loss on top, below the NW end post;

L0L1 of South truss - a few hot spots of corrosion with minor section loss;

L2L3 of South truss - 3" diameter pitting area on the inside flange @ L3 - 1/8" deep section loss;

L3L4 of South truss - pitting & minor section loss (1/8” max. depth) - inside faces of flanges on top;

L6L7 of South truss - heavy corrosion below SE end post - flange up to 1/8" deep loss x1"x16" on inside flange, 1/4" loss x 2" dia. outside flange, 1/8"x1"x24" area near web.

Upper Chords and End Post:

Steel Lacings have corrosion & major section loss or are missing @ NW & SE end posts, (both L0-U1's), over the lower +- 8-feet.

All other Upper Chord Members looked to be in good condition, from the deck.

Gusset Plates:

Vertical Gusset Plates - connecting truss members:

All plates 3/8" thick, unless noted otherwise;

At L1 and L6, there are two individual plates, one on each side of the vertical;

L0 of North truss - fairly heavy corrosion & section loss near end of lower chord;

L2 of North truss - slight bowing of outside plate W. of vertical, 1/4" pack rust @ U2L2, pitting outside face over U2L2 near top of plate;

L3 of North truss - pitting & section loss painted over on inside plate W. of vertical;

L4 of North truss - minor outward bow of inside & outside plates on W.

side of vertical, pitting areas;

L5 of North truss - pitting & section loss 1/16" x 2" diameter @ end of U6L5 on the inside face of the inside plate W. of the vertical, pack rust bows outside plate out ~1/4" E. of vertical;

L6 of North truss - plate E. of vertical has 2" diameter hole (section loss), below centerline of rivets (see picture), 1/8" deep x 1" diameter pitting area between horizontal & vertical rivet lines;

L7 of North truss - heavy corrosion, minor section loss & pack rust near end of lower chord;

L0 of South truss - 15/32" thick - inside & outside plates, hot spots of corrosion @ SE end post, section loss areas - both plates, inside faces underneath LO-L1 member, near the east end of the LO-L1 rivets. Section loss is +- 60% over an area that is 3" high X 10" long, (this is NOT a Critical Finding);

L1 of South truss - minor corrosion @ edges;

L2 of South truss - minor outward bow of outside plate E. of vertical;

L3 of South truss - pitting & section loss @ end of U2L3 - W. of vertical;

L4 of South truss - pitting & minor section loss, minor corrosion & some pack rust between gusset plate & U5L4;

L5 of South truss - minor pitting, outside plate W. of vertical - edge bows out 1/4" due to pack rust;

L6 of South truss - pitting painted over W. of vertical;

L7 of South truss - minor pitting.

Connection plates:

There is 2- 1"x1" hole in the horizontal base plate in the NW & SW corner, at the corner of the railing post connection - seen by standing on top of the bridge, leaning over the railing & looking down.

Horizontal connection plates: moderate corrosion & section loss- esp. @ SE end post; pack rust causing some distortion between floor beams & gussets @ L2 of N. truss, L5 of S. truss and at both ends of floor beam #2 (L6 of N. truss & L1 of S. truss).

Lacings:

Steel Lacings have corrosion & fairly heavy section loss or are missing @ NW & SE end posts.

Rivets:

Heavy corrosion of rivets @ gusset plate in SE corner; other scattered rivets have some section loss.

Collision Damage:

Very minor impact damage to the East Portal.

Bearings:

The concrete support block for the east end floor beam has spalled in the support area. Steal Bearings are rusted, but OK.

Maintenance:

There are trees that protrude through the North Truss and over the north shoulder area, over the bridge deck. The leaves from these trees fall off and fill the lower truss chords all winter long. These trees should be cut way back from the truss. The truss needs to be cleaned out at least twice a year in order to prevent corrosion, so as to keep this bridge in service for many more years.

***** Gusset Plate Inspection on 09/13/2012 by RQAW *****

Jim Lesh of RQAW, Load Rated the Gusset Plates on 09/25/2012, after conducting a field inspection. Jeremy Hunter checked the calculations on 10/02/2012.

The RQAW Inspection Notes included the following:

North Truss -- there is bowing of the L4-L5 gusset plates. There is pack rust that has developed between the members and the gusset plates plate which has the caused gusset plate to warp. This warping will put tensile

stress into the rivets which decreases their shear capacity.

South Truss -- there is warping of the gusset plate at L-2.

From the analysis, it is noted that: the rows of rivets affected by the warping and prying action were removed from the gusset capacity checks for the corresponding members. These capacity reductions did not result in a governing load rating for this bridge.

The full Gusset Plate analysis report has been attached into "BIAS".

Inspector: Bonnie L. Money
Asset Name: 026-38-03430 A
Inspection Date: 08/30/2017
Facility Carried: SR 26

Bridge Inspection Report

IDENTIFICATION

(1) STATE CODE:	185 - Indiana
(8) STRUCTURE:	007040
(5 A-B-C-D-E) INV. ROUTE:	1 - 3 - 1 - 00026 - 0
(2) HIGHWAY AGENCY DISTRICT:	03 - Greenfield
(3) COUNTY CODE:	038 - JAY
(4) PLACE CODE:	61236 - PORTLAND
(6) FEATURES INTERSECTED:	SALAMONIE RIVER
(7) FACILITY CARRIED:	SR 26
(9) LOCATION:	00.78 E US 27
(11) MILEPOINT:	0014.300

(12) BASE HIGHWAY NETWORK:	0
(13A) INVENTORY ROUTE:	
(13B) SUBROUTE NUMBER:	
(16) LATITUDE:	40.43255
(17) LONGITUDE:	-84.963486
(98) BORDER	
A) STATE NAME:	
B) PERCENT	%
(99) BORDER BRIDGE STRUCT. NO:	

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN:	
A) KIND OF MATERIAL/DESIGN:	3 - Steel
B) TYPE OF DESIGN/CONSTR:	10 - Truss - Thru
(44) STRUCTURE TYPE, APPROACH SPANS:	
A) KIND OF MATERIAL/DESIGN:	0 - Other
B) TYPE OF DESIGN/CONSTR:	00 - Other

(45) NUMBER OF SPANS IN MAIN UNIT:	001
(46) NUMBER OF APPROACH SPANS:	0000
(107) DECK STRUCTURE TYPE:	1 - Concrete Cast-in-Place
(108) WEARING SURFACE/PROT SYS:	
A) WEARING SURFACE:	3 - Latex Concrete or similar additive
B) DECK MEMBRANE:	0 - None
C) DECK PROTECTION:	0 - None

AGE OF SERVICE

(27) YEAR BUILT:	1941
(106) YEAR RECONSTRUCTED:	1979
(42) TYPE OF SERVICE:	
A) ON BRIDGE:	1 - Highway
B) UNDER BRIDGE:	5 - Waterway

(28) LANES:	
A) ON BRIDGE:	02
B) UNDER BRIDGE:	00
(29) AVERAGE DAILY TRAFFIC:	002541
(30) YEAR OF AVERAGE DAILY TRAFFIC:	2014
(109) AVERAGE DAILY TRUCK TRAFFIC:	16 %
(19) BYPASS DETOUR LENGTH:	003 MI

Bridge Inspection Report

GEOMETRIC DATA

(48) LENGTH OF MAX SPAN:	0150.0	FT	(35) STRUCTURE FLARED:	0 - No flare	
(49) STRUCTURE LENGTH:	00154.7	FT	(10) INV RTE, MIN VERT CLEARANCE:	15.00	FT
(50) CURB/SIDEWALK WIDTHS:			(47) TOT HORIZ CLEARANCE:	028.0	FT
A) LEFT	00.5	FT	(53) VERT CLEAR OVER BR RDWY:	14.64	FT
B) RIGHT:	00.5	FT	(54) MIN VERTICAL UNDERCLEARANCE:		
(51) BRDG RDWY WIDTH CURB-TO-CURB:	028.0	FT	A) REFERENCE FEATURE:	N	
(52) DECK WIDTH, OUT-TO-OUT:	029.0	FT	B) MIN VERT UNDERCLEAR:	0	FT
(32) APPROACH ROADWAY	028.0	FT	(55) LATERAL UNDERCLEARANCE RIGHT:		
(33) BRIDGE MEDIAN:	0 - No median		A) REFERENCE FEATURE:	N	
			B) MIN LATERAL UNDERCLEAR:	000.0	FT
(34) SKEW:	00	DEG	(56) MIN LATERAL UNDERCLEAR ON LEFT:	000.0	FT

INSPECTIONS

(90) INSPECTION DATE:	10/13/2016	(91) DESIGNATED INSPECTION FREQUENCY:	24 MONTHS
(92) CRITICAL FEATURE INSPECTION:		(93) CRITICAL FEATURE INSPECTION DATE:	
A) FRACTURE CRITICAL REQUIRED/FREQUENCY:	Y 24	A) FRACTURE CRITICAL DATE:	08/30/2017
B) UNDERWATER INSPECTION REQUIRED/FREQUENCY:	N	B) UNDERWATER INSP DATE:	
C) OTHER SPECIAL INSPECTION REQUIRED/FREQUENCY:	N	C) OTHER SPECIAL INSP DATE:	

CONDITION

(58) DECK:	5 - Fair Condition (minor section loss)	(60) SUBSTRUCTURE:	5 - Fair Condition (minor section loss)
(58.01) WEARING SURFACE:	5 - Fair Condition	(61) CHANNEL/CHANNEL PROTECTION:	5 - Bank eroded.. major damage
(59) SUPERSTRUCTURE:	5 - Fair Condition (minor section loss)	(62) CULVERTS:	N - Not Applicable

CONDITION COMMENTS

(58) DECK: 5 - Fair Condition (minor section loss)

Comments:

Deck (underside) has corrosion to metal (SIP) forms - several areas of heavy corrosion at the corners, especially at the NE end of the deck, and along the edges of the Floor Beam upper flanges, near the copings.

Concrete Copings have minor spalls, with narrow vertical & horizontal cracks.

Steel bridge railing has corrosion at connections & section loss holes - SE & NW; minor collision rubs & scratches on both railings; 2 railing bolts sheared off on the back side of the first vertical @ NE corner

(58.01) WEARING SURFACE: 5 - Fair Condition

Comments:
Wearing surface has numerous narrow transverse cracks over each interior Floor Beam. Usually two or three parallel transverse cracks with random map cracking propagating out. A few hailrine longitudinal cracks at the west end of the deck. One concrete patch in the WBL at east end. Three concrete patches in the EBL, near mid-span. A drain grate along the north curb line has been replaced with a steel plate.

(59) SUPERSTRUCTURE: 5 - Fair Condition (minor section loss)

Comments:
See the 08/27/2015 Fracture Critical Inspection Report for more details. Inspection used Standard No. 1522 to identify the truss panel points (labeled left-to-right from roadway side of each truss). L0-X is in SE corner of bridge; L0-Y is in NW corner of bridge. South is "X" truss, north is "Y" truss, Floor Beam 1 is on west end, Floor Beam 8 is on east end, Stringer1 is on south side, and Stringer10 is on north side. Deterioration (loss of lacing on end posts, corrosion of gusset plates) in SE & NW corners are of particular concern. Noticeable vertical and lateral movement under live loading, with booms/bangs heard at ends of deck (likely from loose joints and/or floor beams tapping support blocks).

See the Executive Summary for general comments/notes on superstructure members.

(60) SUBSTRUCTURE: 5 - Fair Condition (minor section loss)

Comments:
Breastwalls have wide vertical and horizontal cracks; delaminations & spalls in re-pointed areas, both E & W Abutments, worse at the East Abutment, due to water leakage through the BS joint.

Concrete Caps and Backwalls have minor vertical cracks.

Erosion at corners - concrete turnout/paved side ditch undermined, cracked & settled @ NE & SE corners; ponding at the west abutment; fairly deep erosion gulleys on both banks below bridge.

(61) CHANNEL/CHANNEL PROTECTION 5 - Bank eroded.. major damage

Comments:
Channel has very heavy bank erosion, many downed trees and exposed roots.

Evidence of highwater above the lower chord - see pictures (8/9/11).

No rip rap or other channel protection at or nearby the bridge. - No evidence of channel scour.

(62) CULVERTS: N - Not Applicable

Comments:

LOAD RATING AND POSTING

(31) DESIGN LOAD:	5 - HS 20	(66) INVENTORY RATING:	28
(70) BRIDGE POSTING	5 - Equal to or above legal loads	(65) INVENTORY RATING METHOD:	1 - Load Factor (LF)
		(66B) INVENTORY RATING (H):	16
(41) STRUCTURE OPEN/POSTED/CLOSED:	A - Open	(66C) TONS POSTED :	
		(66D) DATE POSTED/CLOSED:	
(64) OPERATING RATING:	46		
(63) OPERATING RATING METHOD:	1 - Load Factor (LF)		

Inspector: Bonnie L. Money
Asset Name: 026-38-03430 A
Inspection Date: 08/30/2017
Facility Carried: SR 26

Bridge Inspection Report

APPRAISAL

SUFFICIENCY RATING:	63.6	(36) TRAFFIC SAFETY FEATURE:	
STATUS:	0	36A) BRIDGE RAILINGS:	0
(67) STRUCTURAL EVALUATION:	5	36B) TRANSITIONS:	0
(68) DECK GEOMETRY:	4	36C) APPROACH GUARDRAIL:	0
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL:	N	36D) APPROACH GUARDRAIL ENDS:	0

(71) WATERWAY ADEQUACY: 9 - Bridge Above Flood Water Elevations

Comments:
~4' max. HW to E. approach PG.

Evidence of highwater above the lower chord - see pictures (8/9/11).

(72) APPROACH ROADWAY ALIGNMENT: 8 - Equal to present desirable criteria

Comments:
Good. SR-26 is straight and flat on both sides of the bridge.

Approach slabs have wide longitudinal cracks along center construction joint.
Approach guardrail is substandard - aluminum; leaning outward.
Approach pavement has wide random cracks & minor rutting; wedges replaced in 2000.
West Shoulders failing.
Narrow shoulders all sides. Little room to park inspection vehicles.

(113) SCOUR CRITICAL BRIDGES: 8 - Stable for scour conditions

Comments:
Spread Footings, ON Piles, at both Abutments.

Bottom of Footing elevation = 75.77' at West Abutment.
Bottom of Footing elevation = 75.02' at East Abutment.

The 1941 Flow Line elevation = 78.80'
The 1933 High Water elevation = 94.80'

Soil is sand and clay over gravel

CLASSIFICATION

(20) TOLL:	3 - On Free Road	(21) MAINT. RESPONSIBILITY:	01 - State Highway Agency
(22) OWNER:	01 - State Highway Agency	(26) FUNCTIONAL CLASS OF INVENTORY RTE:	16 - Urban - Minor Arterial
(37) HISTORICAL SIGNIFICANCE:	2 - Eligible for National Register	(100) STRAHNET HIGHWAY:	Not a STRAHNET route
(101) PARALLEL STRUCTURE:	N - No parallel structure	(102) DIRECTION OF TRAFFIC:	2-way traffic
(103) TEMPORARY STRUCTURE:		(104) HIGHWAY SYSTEM OF INVENTORY ROUTE:	0 - Structure/Route is NOT on NHS
(105) FEDERAL LANDS HIGHWAYS:	0-Not Applicable	(110) DESIGNATED NATIONAL NETWORK:	Inventory route on National Truck Network
(112) NBIS BRIDGE LENGTH:	Yes		

NAVIGATION DATA

(38) NAVIGATION CONTROL:	0 - No navigation control on waterway (bridge permit not required)	(39) NAVIGATION VERTICAL CLEAR:	000.0 FT
		(116) MINIMUM NAVIGATION VERT. CLEARANCE, VERT. LIFT BRIDGE:	FT
(111) PIER OR ABUTMENT PROTECTION:		(40) NAV HORIZONTAL CLEARANCE:	0000.0 FT

PROPOSED IMPROVEMENTS

(75A) TYPE OF WORK:	38 - Other Structural Work	(95) ROADWAY IMPROVEMENT COST:	$ 000000
(75B) WORK DONE BY:	1 - Work to be done by contract	(96) TOTAL PROJECT COST:	$ 000116
		(97) YR OF IMPROVEMENT COST EST:	2015
(76) LENGTH OF IMPROVEMENT:	000154. FT 7	(114) FUTURE AVG DAILY TRAFFIC:	004600
		(115) YR OF FUTURE ADT:	2030
(94) BRIDGE IMPROVEMENT COST:	$ 000116		

- No items available

Miscellaneous Asset Data - Asset # 026-38-03430 A

Bats: seen or heard under structure? N **Birds/swallows/nests seen? Empty nests present?** N

Scour POA? No **Inv Type** S - State Road **Inv #** 26 **Reference Post** 141 **Offset** 23

Joints **Location:** Transverse **Type:** A **Rating (Lowest Rated Joint):** 3

BS seal; adjacent concrete has lots of chipping; debris impaction of seal; ineffective.

Paint **Rating** 5 **Paint Year** 2000

Paint is failing in many areas at or below bridge railing level, particularly at corners of bridge.

☐ **Asset Type Has Changed**

Original RP Data Source Roads & Highways

RP 141 Offset 23

Compliance Month:

Bridge File Complete

Date:

Organization:

Inspector: Bonnie L. Money

Inspection Date: 08/30/2017

Structure Number: 007040

Facility Carried: SR 26

Bridge Inspection Report

Channel Measurement

Date of Channel Measurements:

Distance Measured From:

Depth Measured From:

Number of Measurement Points Taken:

Number of Fixed Objects in Channel:

Water Level:

High Water Mark:

Measurement Type:

Inspector: Bonnie L. Money

Inspection Date: 08/30/2017

Asset Name: 026-38-03430 A

Facility Carried: SR 26

Bridge Inspection Report

Date Reported: 02/18/2015

Priority: Grey - 4

Work Code: Superstructure Cleaning & Flushing

Deficiency Description:

Tree leaves and other debris has filled up many areas of the lower truss chords and lower truss connections. This debris is allowing moisture and chlorides to stay in contact with the steel which results in continued corrosion.

The lower truss chords and connection areas should be thoroughly cleaned at least twice a year in order to keep corrosion to a minimum on this historic bridge. They should be cleaned in late November after all leaves have fallen, and again in late April after all salting activities are complete.

Work Description:

Date Repairs Completed:

Maintenance Comments:

Stage: Open

PHOTO 1 Description 007 - Looking E at typical debris in lower truss chords - 26-38-03430A Salamonie River NBI 007040 01-21-2015.JPG

Inspector: Bonnie L. Money

Inspection Date: 08/30/2017

Asset Name: 026-38-03430 A

Facility Carried: SR 26

Bridge Inspection Report

Date Reported: 02/18/2015

Priority: Grey - 4

Work Code: Brush Cutting / Herbicide Spray

Deficiency Description:

Tree branches are extending through the north truss and almost into traffic over the north shoulder of the bridge deck. Leaves and branches are falling down and into the lower truss members and connections. The tree branches should all be cut back +- 20-feet away from the truss members. This should keep the branches away from traffic and the bridge, and reduce the amount of debris that fills up the lower truss chords. It will also allow room for INDOT Inspectors to use our Underbridge Inspection Machine to inspect the bridge.

A few small trees on the south side of the truss, at the southwest wing area, should also be trimmed back.

Work Description:

Date Repairs Completed:

Maintenance Comments:

Stage: Open

PHOTO 1 Description 009 - Looking W at typical tree branches extending through truss members - 26-38-03430A Salamonie River NBI 007040 01-21-2015.JPG

Stage: Open

PHOTO 2 Description 011 - Looking SW at N elevation - 26-38-03430A Salamonie River NBI 007040 01-21-2015.JPG

Inspector: Bonnie L. Money

Inspection Date: 08/30/2017

Asset Name: 026-38-03430 A

Facility Carried: SR 26

Bridge Inspection Report

Date Reported: 10/13/2016

Priority: Green - 3

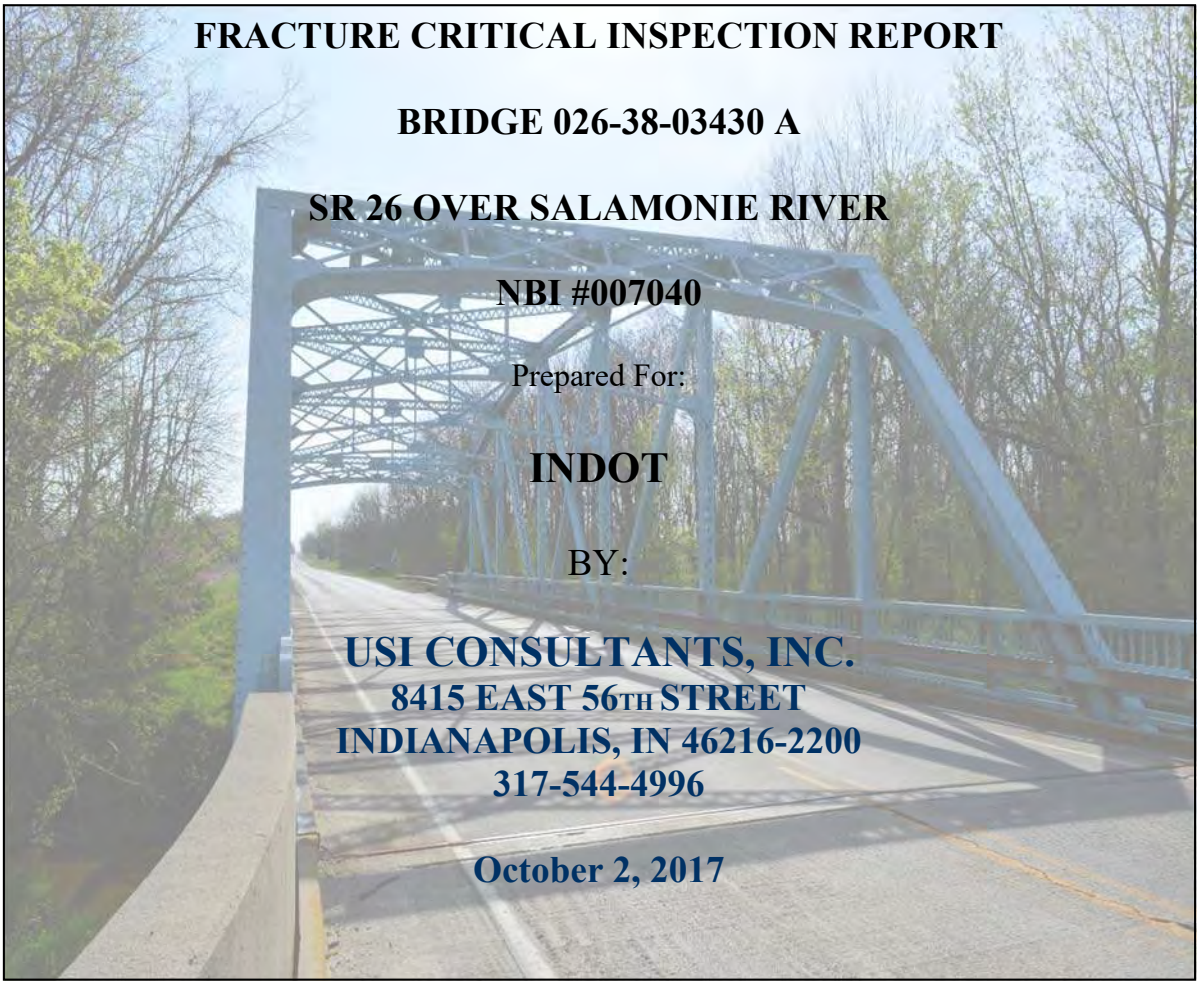
Work Code: Superstructure Cleaning & Flushing

Deficiency Description:
Hornet Net on Superstructure

Work Description:

Date Repairs Completed:

Maintenance Comments:



FRACTURE CRITICAL INSPECTION REPORT

BRIDGE 026-38-03430 A

SR 26 OVER SALAMONIE RIVER

NBI #007040

Prepared For:

INDOT

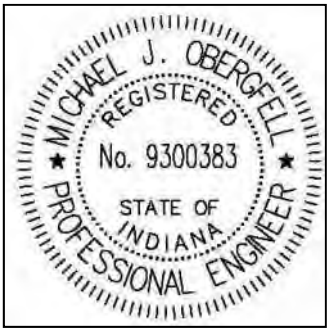
BY:

USI CONSULTANTS, INC.
8415 EAST 56TH STREET
INDIANAPOLIS, IN 46216-2200
317-544-4996

October 2, 2017

I hereby certify that this report was prepared under my direct personal supervision and that I am a duly Registered Professional Engineer under the laws of the State of Indiana.

Michael J. Obergfell, PE
Chief Operating Officer



Robert M. Coop, PE
Bridge Inspection Manager

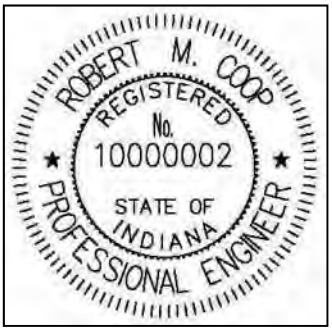


TABLE OF CONTENTS

FRACTURE CRITICAL INSPECTION REPORT

BRIDGE 026-38-03430 A
SR 26 OVER SALAMONIE RIVER
NBI #007040

I. LOCATION AND DESCRIPTION

Bridge No. 026-38-03430 A, a seven (7) panel Pratt through truss, carries SR 26 over the Salamonie River in Jay County, Indiana at RP 141+23. The bridge was built in 1941 and is identified as a Historic Non-Select bridge. The bridge was repaired in 1979 with a new deck and some structural repairs. The structure length is 154.7 feet long with a maximum span of 150 feet. The bridge has a clear roadway width of 28 feet accommodating two lanes of traffic and an out to out width of 29 feet. The bridge is currently load rated for 20 tons. The average daily traffic (ADT) in 2014 was estimated at 2541 vehicles per day.

The bridge is located immediately east of Portland, Indiana at latitude 40° 25' 57" and longitude of -84° 57'48". See Appendix A Figure 1 for the location map.

II. PURPOSE AND SCOPE

The purpose of this inspection was to provide an in-depth condition evaluation of all fracture critical members of the steel truss. The scope of the inspection consisted of a detailed, hands-on examination of all fracture critical members, fatigue sensitive details and connections.

This report includes a description of the structure, inspection procedures used, summary of the findings, an evaluation of the findings, and any recommendations based on these findings.

III. INSPECTION PROCEDURE

On August 17, 2017, coordination plans were developed with INDOT's Greenfield District to conduct the inspection of SR 26 over the Salamonie River on August 30 and 31, 2017 between the hours of 8:00-2:00 each day. Subsequently, INDOT provided traffic control, a platform truck, the UB-32 bridge truck, and equipment operators. The east bound lane was closed on August 30 and the West Bound lane was closed on August 31. USI Consultants performed the inspection.

Prior to the inspection of the bridge, USI obtained and reviewed the previous Fracture Critical Inspection report, as built plans and standard INDOT camel back truss plans. A four person team consisting of Bonnie L. Money, PE (IN000253-2019-ATL-F-LRE), Rob Coop, PE (IN000127-2020-ATL UF), Brett Longenecker, EI (IN000248-2019-ATL-UF) and Jason Peterson (Bridge Inspector) performed the fracture critical inspection.

The fracture critical inspection consisted of detailed arm's length inspection of all members and connections of the steel truss. Visual inspection of joints, members, and bearings were performed to locate possible problem areas in the truss members. Deficiencies were documented with photos and notes and are summarized below in Section III.F of this report.

A. Equipment

- Hard Hat
- Safety Glasses
- Wire Brush
- Hammer
- Tape Measure
- Camera
- Flashlight
- Magnifying Glass
- Probe Rod
- Ladder
- Plumb Bob
- Level

B. Access

Parking was available along the side of the road near the end of the approach guardrail east and west of the bridge. Abutments and bearings was accessed on foot underneath the bridge. Lower chords and connections were evaluated using an Aspen B 32 bridge truck and the truss above deck was accessed using INDOT's platform truck.

C. Maintenance of Traffic

INDOT provided maintenance of traffic, closing the eastbound lane on day one and the westbound lane on day two.

D. Inspection Procedure

All members and connections, including joints, members, and bearings, were inspected at arm's length to identify any defects and the extent of deterioration. Photographs were taken to document typical conditions and significant defects.

E. Bridge Orientation:

- Abutment #1 is at the West End.
- North Truss is the "Y" Truss on the Design Plans - panel points are numbered from west to east, with L0 at the west end.
- South Truss is the "X" Truss on the Design Plans - panel points are numbered from east to west, with L0 at the east end.
- Floor Beam #1 is at the West end of the deck.
- Stringer #1 is at the South edge of the deck, in each panel.
- Channel - The Salamonie River flows from north to south under the bridge.

IV. **CONDITION** DESCRIPTION

Stringers - Minor to moderate section loss to flanges and webs of fascia stringers in the end panels primarily at the stringer connections to floorbeams. Defects primarily on the exterior face of the fascia beams.

- Fascia stringer, L3-L2 at L3-Y – 1" diameter hole in bottom flange; remaining steel tapers down to paper thin at edges (See Photo 18);
- Stringer 1 at Northeast corner (L0-Y) – section loss (1/4" x 3" x 8" in Flange; 1/8" x 6" x 8" in Web), debris collecting on bottom flange, etc. (See Photo 16)
- Section loss to Stringer 1 (L1-L2 Y) approximately 1/8" x 4" x 8" in Web and 1/8" x 4" x 6" in Bottom Flange (See Photo 14)
- Stringer #2 from the north on E. side of floor beam #4 - top flange damaged with a 2" tear in the coped area.

Floor Beams – All floor beams have some pitting, rust, and/or deterioration at the ends at the lower lateral bracing gusset plate connections. No significant defects were noted on the interior sections of the floor beams.

- Floor beams 2 and 3 near N. truss – bottom flanges have areas of pitting of up to 1/8" deep.
- Floor beam 4 - Corrosion "hot spots" on top of bottom flange 1/8" max. depth at 1"x1" and 2"x2" areas on west side, near the south truss.
- Floor beam 5 - Bottom flange has 1/4" section loss in bottom flange (originally 1 1/8" thick reduced to 7/8") for a 2" wide x 3" long area along the edge of the horizontal gusset plate at the north end (See Photo 19); minor section loss at edge of gusset at S. truss;
- Floor beam 7 – Section loss of ¼" x 3" x 2' long at south end (See Photo 25).

Verticals:

- U4L4 of North truss - corrosion holes through outside channel at deck level - 1" and 2" diameter;
- U2L2 of South truss - minor corrosion and pitting at railing connection, one minor collision scrape at the NW corner approximately 18" above railing;
- U3L3 and U5L5 of South truss - lacing has minor corrosion on lower half of verticals;
- U4L4 of South truss, U3L3 and U4L4 of North truss - minor pack rust between sway frame angles and verticals.

Diagonals:

- NW and SE end posts have corrosion, pitting and minor section loss on the inside face of the outside channel section (See Photo 28).
- U1L2 of North truss - 3 rivets have heavy corrosion and section loss bottom end on E. face
- U3L4 of North truss - outside flange has minor hot spots of corrosion on the bottom side
- U1L2 of South truss - hot spots of corrosion in the flange and web near lower chord and behind the railing - minor section loss heavier near lower chord;
- U3L4 of South truss - 3 rivets have heavy corrosion and section loss on the outside flange;
- U4L3 of South truss – approximately 4' long area of minor mill scale rusting near the bottom on the inside face of the outside flange.

Lower Chords:

- Corrosion and section loss to lower chord splice plates (1/4" max. edge loss) - N. truss near L4 and S. truss near L2 and L4;
- Pitting areas with minor section loss painted over are typical;
- L0L1 of North truss - minor corrosion at E. end top of web and flanges;
- L1L2 of North truss - some pitting 1/8" deep, 1 small spot with corrosion inside flange near L2;
- L2L3 of North truss- few small spots of pitting and section loss up to 1/8" deep on inside faces at L3;
- L3L4 of North truss – deep pitting and section loss along inside face of interior vertical leg – 1/16" to 3/8" x 3" by Full Length (See Photo 27)
- L4L5 of North truss – At L5 pitting, minor rust, typical
- L5L6 of North truss - corrosion, pitting and minor section loss on top, below the NW end post;
- L6L7 of North truss - corrosion, pitting and minor section loss on top, below the NW end post;
- L0L1 of South truss - a few hot spots of corrosion with minor section loss;
- L2L3 of South truss - 3" diameter pitting area on the inside flange at L3 - 1/8" deep section

loss;
- L3L4 of South truss - pitting and minor section loss (1/8” max. depth) - inside faces of flanges on top;
- L6L7 of South truss - heavy corrosion below SE end post - flange up to 1/8" deep loss x1"x16" on inside flange, 1/4" loss x 2" dia. outside flange, 1/8"x1"x24" area near web (See Photos 35 and 36).

Upper Chords and End Post:
- Steel lacings bars at the northwest and southeast end posts have corrosion and major section loss or are missing over the lower +/- 8-feet (See Photos 9 and 10).
- All other Upper Chord Members are in good condition.

Gusset Plates - Vertical Gusset Plates - connecting truss members: All plates 3/8" thick, unless noted otherwise
- At L1 and L6, there are two individual plates, one on each side of the vertical
- L0 of North truss – Moderate to heavy corrosion and section loss near end of lower chord
- L2 of North truss - slight bowing of outside plate W. of vertical, 1/4" pack rust at U2L2, pitting outside face over U2L2 near top of plate
- L3 of North truss - pitting and section loss painted over on inside plate W. of vertical
- L4 of North truss - minor outward bow of inside and outside plates on W. side of vertical, pitting areas
- L5 of North truss - pitting and section loss 1/16" x 2" diameter at end of U6L5 on the inside face of the inside plate W. of the vertical, pack rust bows outside plate out ~1/4" E. of vertical. Rivets at L5U6 at both exterior legs – 3 of 7 rivets have 50% section loss
- L6 of North truss - plate E. of vertical has 2" diameter hole (section loss), below centerline of rivets, 1/8" deep x 1" diameter pitting area between horizontal and vertical rivet lines
- L7 of North truss - heavy corrosion, minor section loss and pack rust near end of lower chord
- L0 of South truss - 15/32" thick - inside and outside plates, hot spots of corrosion at SE end post, section loss areas - both plates, inside faces underneath L0-L1 member, near the east end of the LO-L1 rivets. Section loss is +- 60% over an area that is 3" high X 10" long, (this is NOT a Critical Finding)
- L1 of South truss - minor corrosion at edges
- L2 of South truss - minor outward bow of outside plate E. of vertical
- L3 of South truss - pitting and section loss at end of U2L3 - W. of vertical (See Photo 26)
- L4 of South truss - pitting and minor section loss, minor corrosion and some pack rust between gusset plate and U5L4
- L5 of South truss - minor pitting, outside plate W. of vertical - edge bows out 1/4" due to pack rust
- L6 of South truss - pitting painted over W. of vertical;
- L7 of South truss - minor pitting.

Connection Plates:
- There is 2- 1"x1" hole in the horizontal base plate in the NW and SW corner, at the corner of the railing post connection - seen by standing on top of the bridge, leaning over the railing and looking down.
- Horizontal connection plates have moderate corrosion and section loss, especially at the southeast end post; pack rust causing some distortion at most locations.

- All lower lateral bracing gusset plates have pack rust and deformation at connections (See Photos).

Lacings - Steel Lacings have corrosion and moderate to heavy section loss especially in the splash zone. Lacing bars are missing at the northwest and southeast endposts (See Photos 9 and 10).

Rivets - Heavy corrosion of rivets at gusset plate in SE corner; other scattered rivets have some section loss (See Photo 35)**.**

Collision Damage - Minor impact damage to the East Portal (See Photo 40).

Bearings - The **concrete** support block for the east end floor beam has spalled in the support area. Steel Bearings are rusted, but functional. (See Photos 29-38).

Maintenance - There are trees that protruded through the North Truss and over the north shoulder area and over the bridge deck. INDOT Maintenance removed several branches and limbs affecting the bridge on August 31, 2017. The truss, abutment bridge seats and bearings need to be cleaned at least twice a year to prevent corrosion and keep this bridge in service for many more years.

Additional information From Previous Gusset Plate Inspection on 09/13/2012 by RQAW:

Jim Lesh of RQAW, Load Rated the Gusset Plates on 09/25/2012, after conducting a field inspection. Jeremy Hunter checked the calculations on 10/02/2012.

The RQAW Inspection Notes included the following:

> North Truss -- there is bowing of the L4-L5 gusset plates. There is pack rust that has developed between the members and the gusset plates plate which has the caused gusset plate to warp. This warping will put tensile stress into the rivets which decreases their shear capacity.
>
> South Truss -- there is warping of the gusset plate at L-2.
>
> From the analysis, it is noted that: the rows of rivets affected by the warping and prying action were removed from the gusset capacity checks for the corresponding members. These capacity reductions did not result in a governing load rating for this bridge.
>
> The full Gusset Plate analysis report has been attached into "BIAS".

V. RECOMMENDATIONS

No major work is recommended at this time. It is recommended that the bearing areas, lower chords and lower connections be cleaned at regular intervals as part of the local routine maintenance. This will prevent debris and moisture from accumulating and accelerating the deterioration process.

Recommend installing riprap at the east abutment to protect the abutment from erosion.

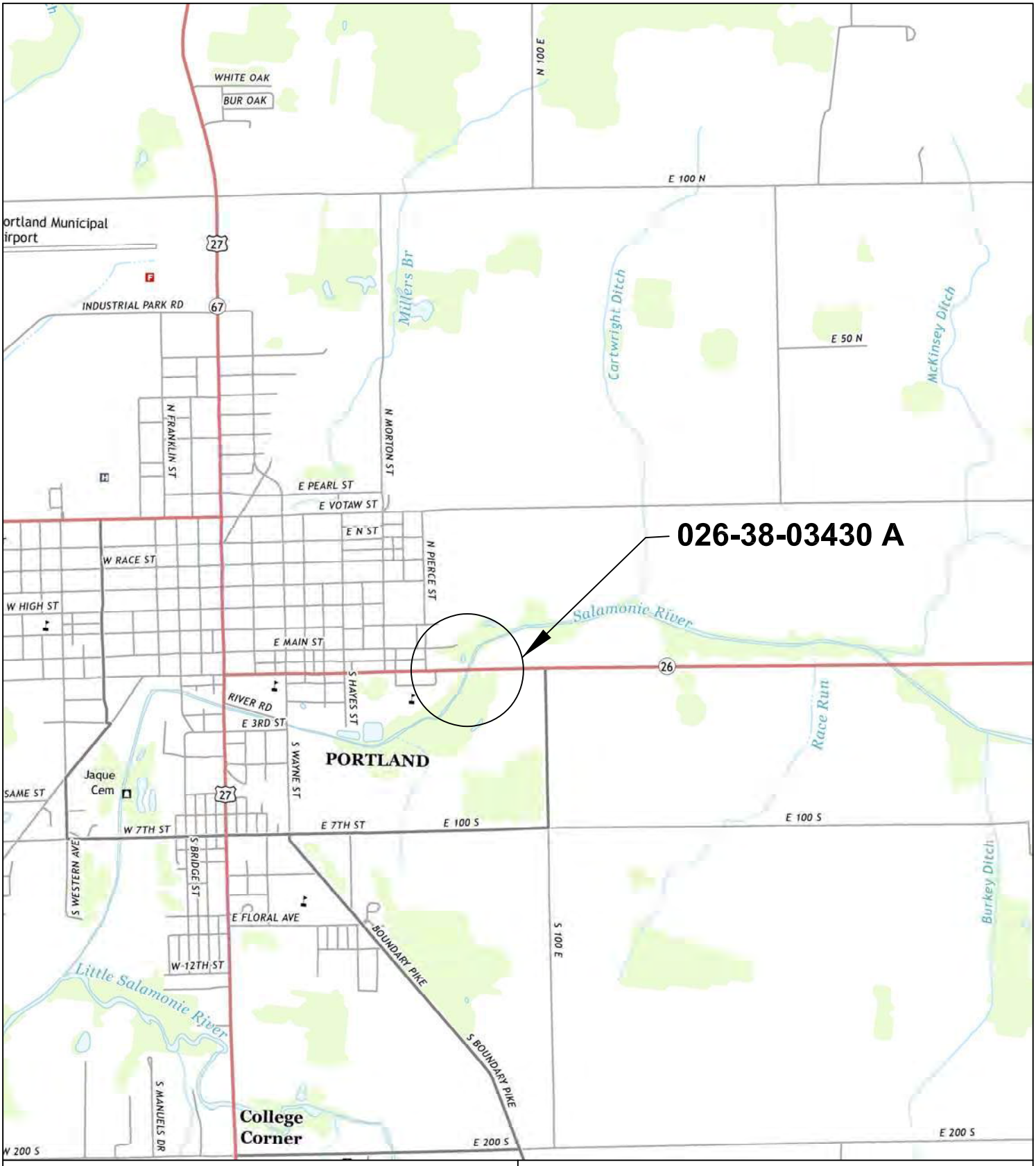
In accordance with the National Bridge Inspection Standards, the special inspection should be conducted every two years.

VI. NBIS CODED INFORMATION

Item Code	Rating
60 – Superstructure	**5**
92C – Critical Feature Inspection (Fracture Critical Inspection Frequency)	**Y24**
93 - Critical Feature Inspection Date:	**8/30/17**

Ratings are based on the information provided in the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nations Bridges.

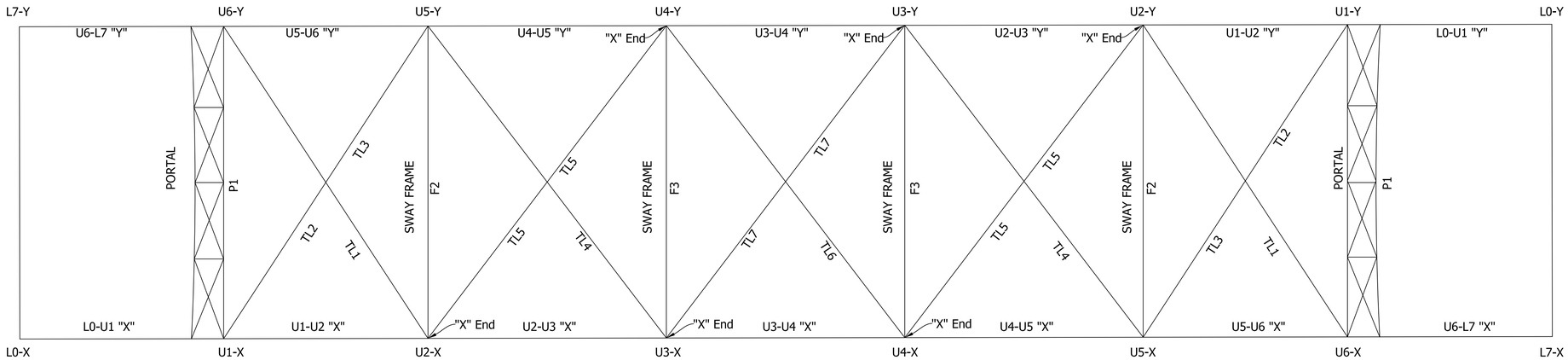
APPENDIX A
FIGURES



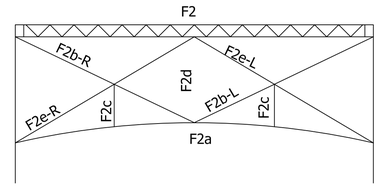
Portland
IN Quadrangle
Scale = 1:24,000

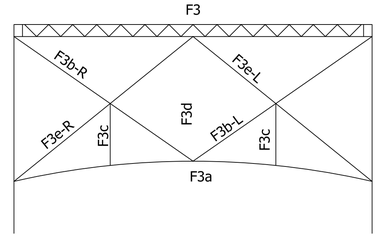
Figure 1
026-38-03430 A
State Rd 26 over Salamonie River
Portland, Indiana

S:\2017Proj\2017-102 SR 26\SR26 Sitemap.dwg

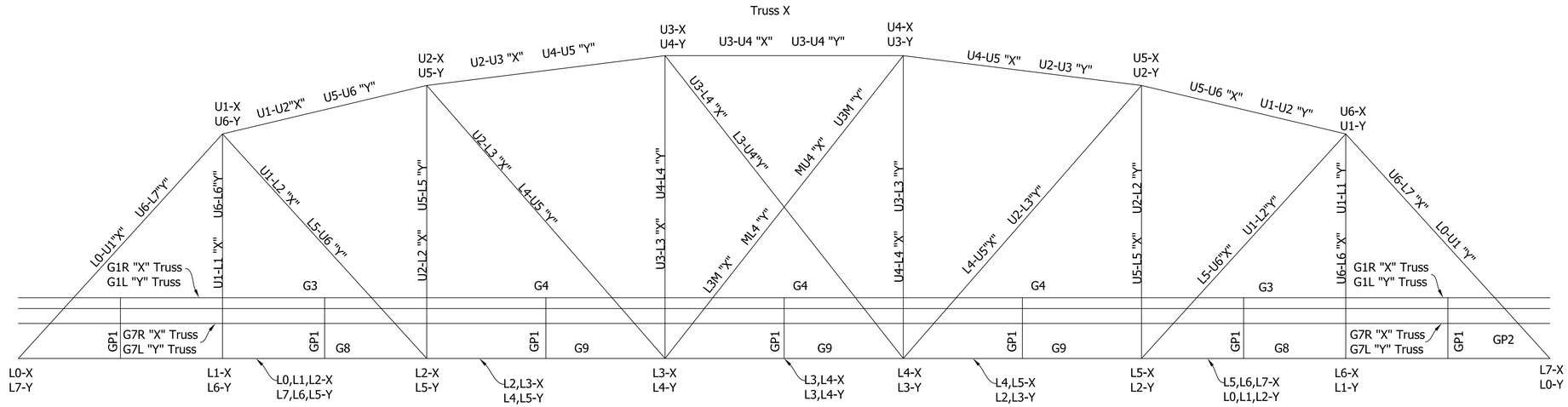


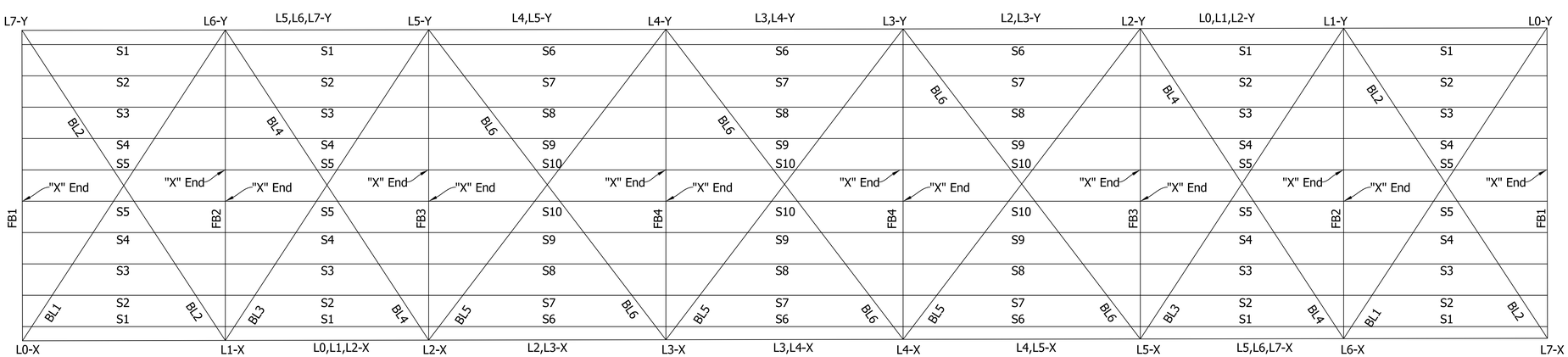
NORTH FACE





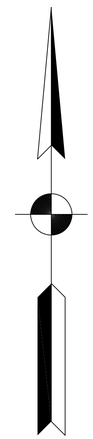
SOUTH FACE



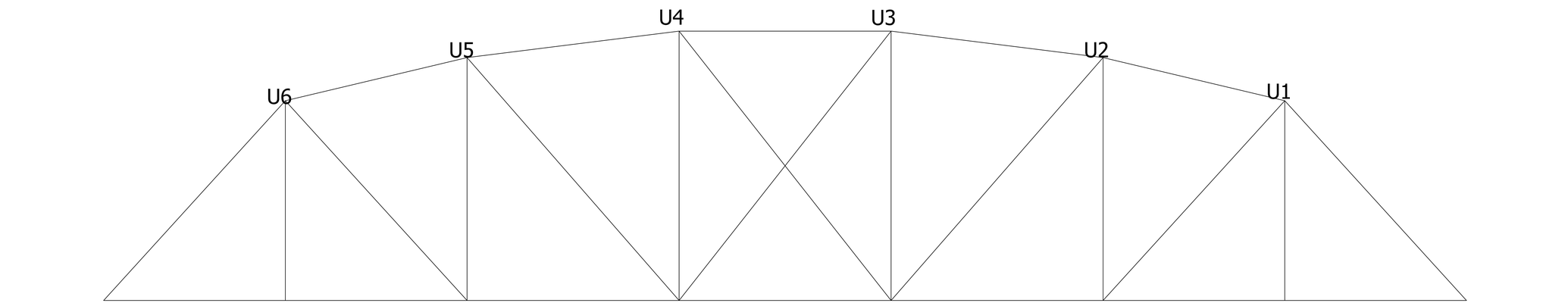


NORTH FACE

SOUTH FACE

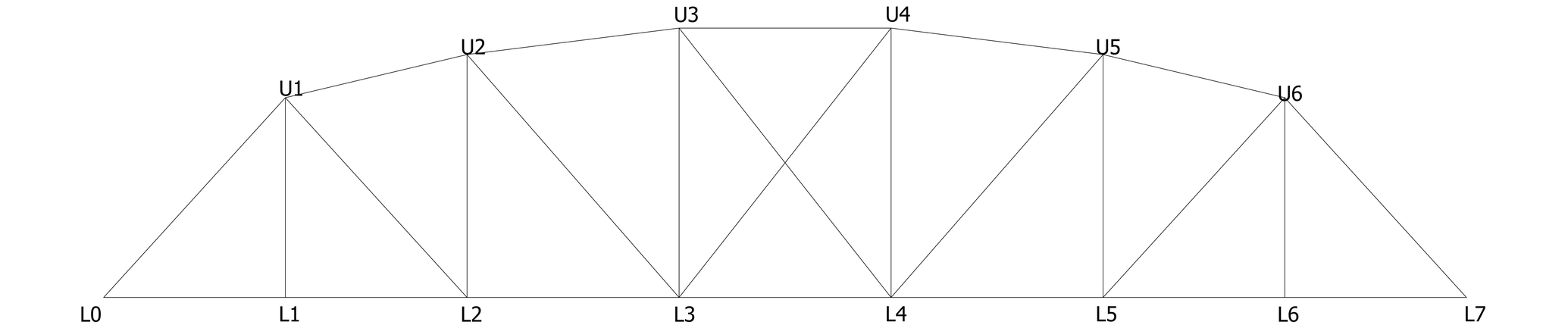


Truss X



South Face

Truss Y



North Face

APPENDIX B
PHOTOGRAPHS

Fracture Critical Inspection Report

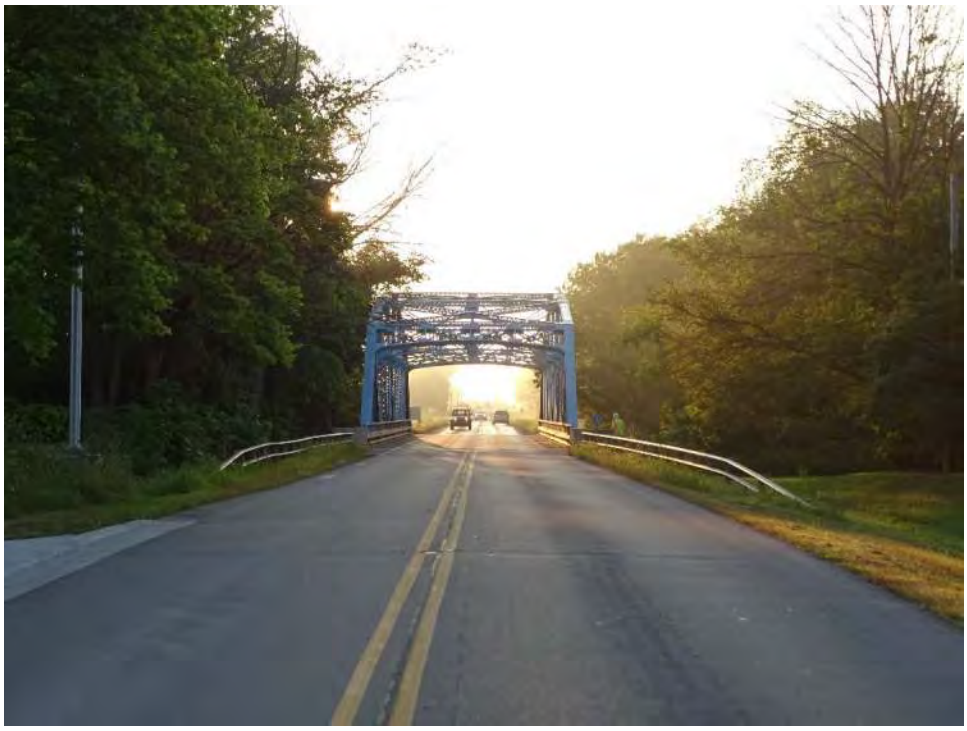


Photo 1: West Approach Looking East

Photo 2: East Approach Looking West

Photo 3: South Face Looking North

Photo 4: North Face Looking South

Photo 5: Looking West at Abutment 1

Photo 6: Looking East at Abutment 2

Photo 7: Floor System

Photo 8: Aerial View of Truss

Photo 9: Southeast End Post - Damaged Lacing Bars

Photo 10: Northwest End Post - Damaged Lacing Bars

Photo 11: Looking W along S Truss at Typical Guardrail Connection

Photo 12: Looking East Along North Bridge Rail

Photo 13: L1-Y- Floor Beam 7 (from West End) Typical Condition at Bracing and Gusset Plate

Photo 14: L2-Y North Stringer Section Loss 4" x 8" x 1/8" in Web and 4" x 6" x 1/8" in Bottom Flange

Photo 15: Concrete Coping Spall 6”x3”x4’ Between L2-L3 Y – Note Delamination of Stringer Top Flange

Photo 16: Stringer 1 at Northeast Corner - Note Heavy Rust, Section Loss (1/4” x 3” x 8” in Flange; 1/8” x 6” x 8” in Web), and Debris

Photo 17: L3-Y Floor Beam 5 Gusset Plate

Photo 18: L3-Y North Stringer (L3-L2) Heavy Pitting and Section Loss – ~ ¼" x 6" x 8" in Bottom Flange with a 1 ½" Diameter Hole

Photo 19: Heavy Rust, Pitting and Section Loss on North End of FB 5, Gusset Plate and Lateral Bracing. Bracing reduced by 50% along end 24" and Gusset Plate Reduced by 50%-75%.

Photo 20: Northwest end of Floor Beam 5 - Note Gusset Plate Connections Pack Rust up to ½"

Photo 21: Northeast end of Floor beam 5 - Note Gusset Plate and Bracing Section Loss ~ 50% of end 12"

Photo 22: Looking S at L1-X - Typical Condition at Bracing Connection

Photo 23: L1-X Lower Lateral Bracing Gusset Plate Deformation with ½" Pack Rust

Photo 24: L2-X at FB6 – Up to ¾" Pack Rust at Horizontal Gusset Plate at Floor Beam Connection

Photo 25: FB7 Horizontal Gusset Plate South End - Moderate Rust, Deep Pitting, Section Loss of ¼" x 3" x 2'

Photo 26: Truss X – West Side of L3U2 – Up to ¾" Pack Rust at Gusset Plate

Photo 27 - L3-L4 Y, Looking East, Section Loss 1/16" to ¼" x 3" x Full Length in Interior Vertical Leg

Photo 28: Truss Y L3U3 2" and 1.5" Holes in Exterior Channel

Photo 29: NW Bearing looking West

Photo 30: NW Bearing – Heavy Rust and Section Loss of Gusset Plate, Rivets, etc. Section Loss in Gusset Plate is 1/8" x 6" x 6"

Photo 31: NW Bearing Interior Connection Angle. Note Rivet Head Section Loss.

Photo 32: Gusset Plates above NW Bearing - Note Stains, Rust and Deterioration

Photo 33: L0-Y Lower Lateral Gusset Plate Section Loss – Approximately 6" of Plate Gone. Viewed from Top

Photo 34: SE Bearing at L0-X

Photo 35: SE Bearing - End of Lower Chord L6L7 showing Section Loss in Web at End, Rivets and Gusset Plates. End of Lower Chord Tapers to Paper This. Rivets 25% to 50% Section Loss.

Photo 36: NE Bearing - Exterior Gusset Plate Section Loss ¼" x 2" x 8" on Exterior Gusset Plate

Photo 37: SW Bearing - Interior Vertical Gusset Plate Section Loss 3/8" x 2" x 12"

Photo 38: SW Bearing - North Face of Interior Gusset Plate Section Loss – 1/8" x 1" x 12" Along Angle.

Fracture Critical Inspection Report

Photo 39: Truss Y - U3 (From East) Pack Rust (Typ.)

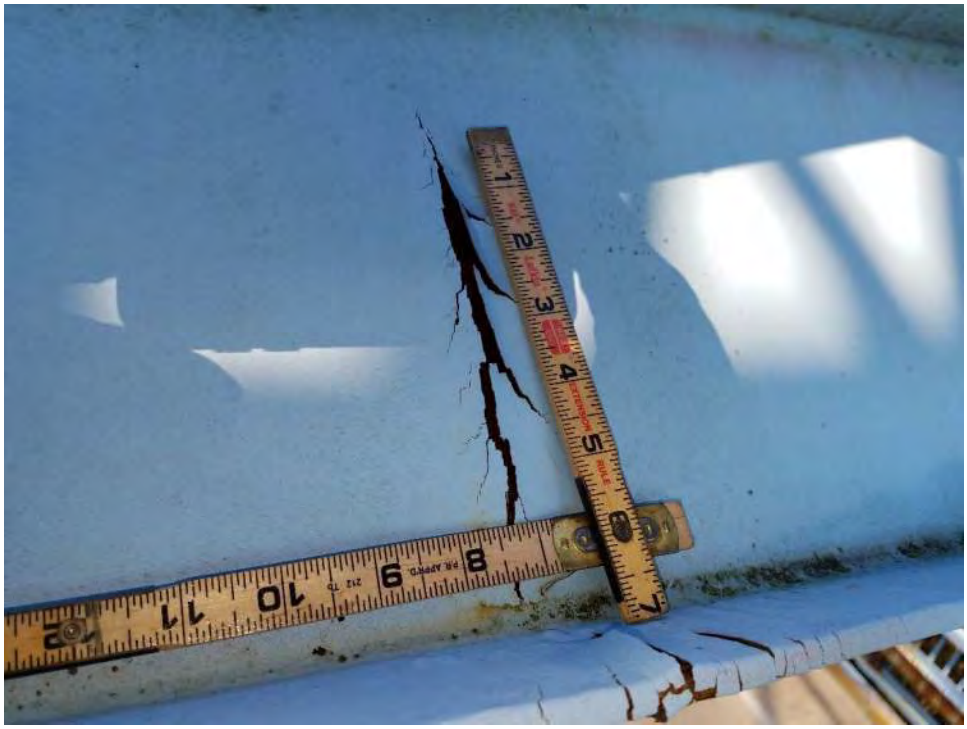


Photo 40: West Portal Bracing Showing Minor Impact Damage – Split Paint

Photo 41: Upper Chord Connection (Typ.)

Photo 42: Portal Bracing Connection - Note Rust Stain and Minor Pack Rust

APPENDIX C

STRUCTURE INVENTORY

AND

APPRAISAL FORM

Bridge Inspection Report

026-38-03430 A
SR 26
over
SALAMONIE RIVER

Inspection Date: 10/13/2016

Inspected By: Joshua Biller

Inspection Type(s): Routine

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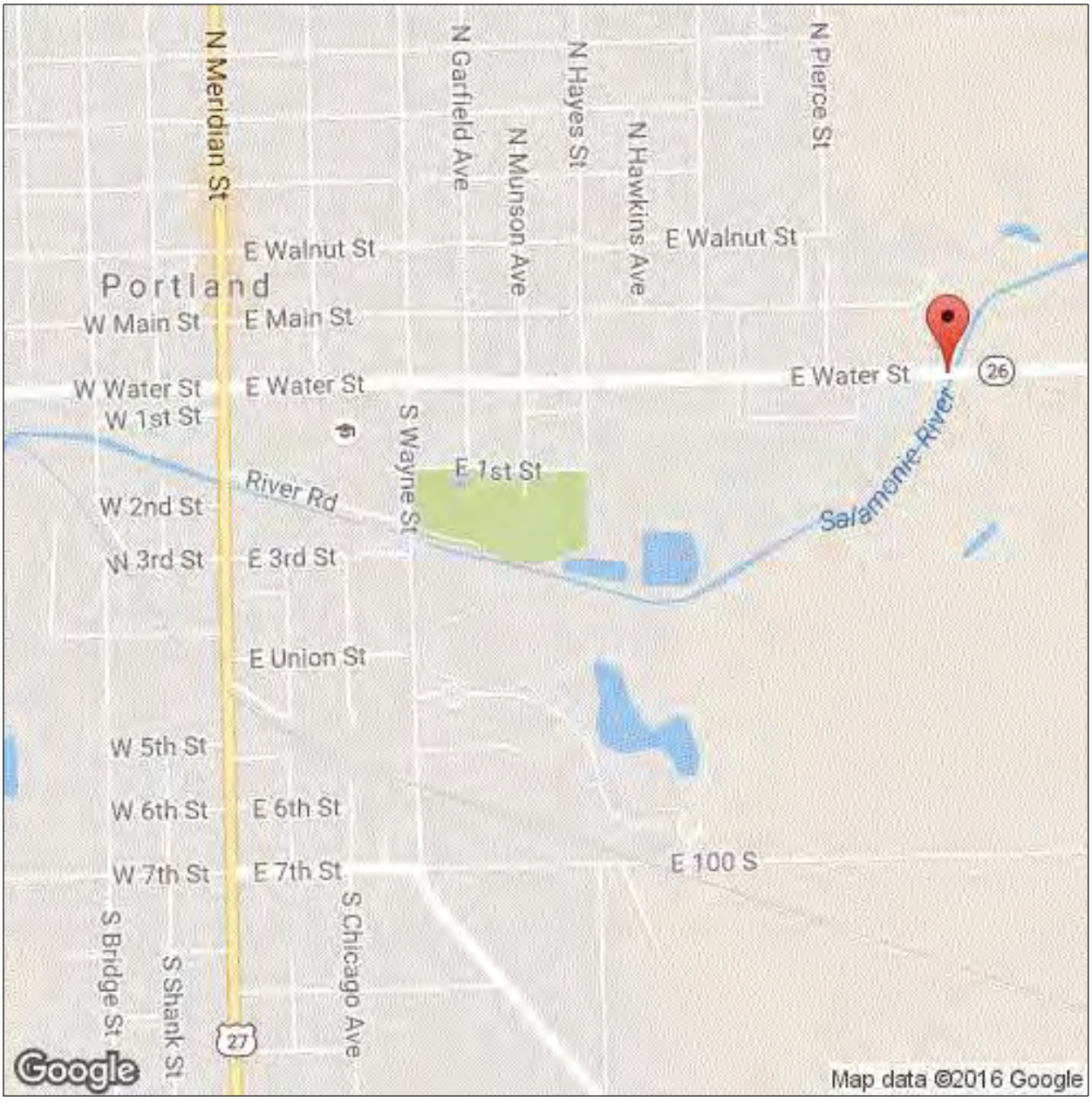
Inspector: Joshua Biller

Inspection Date: 10/13/2016

Asset Name: 026-38-03430 A

Facility Carried: SR 26

Bridge Inspection Report



Latitude: 40.43255

Longitude: -84.963486

SR 26 over Salamonie River (RP 141+23)

7-panel, Pratt (Camel-back) through-truss. Built in 1941, under contract B-2144. 'A' Rehab (replaced deck - built with 1.5" bridge deck surface) in 1979, B-12069.

Historical Bridge: "Non-Select"

Channel: the Salamonie River flows from north to south under the bridge.

Orientation ---
Abutment #1 is at the West End.

North Truss is the "Y" Truss on the Design Plans - panel points are numbered from west to east, with L0 at the west end.

South Truss is the "X" Truss on the Design Plans - panel points are numbered from east to west, with L0 at the east end.

Floor Beam #1 is at the West end of the deck.
Stringer #1 is at the South edge of the deck, in each panel.

Last Fracture Critical Inspection: conducted on 8-27-2015, using the UB-40.

Programmed Work:*suspended contract* for painting with a RFL date of 08/10/2016, DES # 1383052, Contract B-36498. It was last painted in 2000, under Contract M-24790, (3-coat system, blue, 136.1 tons).

Future Work: scheduled for replacement in 2021 (B-39818; Des. 1600828); Letting Date of 09/02/2020;

Roadway: new HMA on west end; chip & seal over HMA on east end; Good Condition;

Guardrail: twin-tube aluminum system on all four corners; Fair Condition;

West Approach: grooves from milling machine on surface at west end; chipping along 1A joint; wide, irregular crack along center line, with spall near 1A joint; spall on curb in SE corner;

West Joint: S-S joint; seal is intact; filled with debris;

East Joint: BS seal; adjacent concrete has lots of chipping; debris impaction of seal; ineffective;

East Approach: similar to west approach;

****** Select Notes from 2016 Routine Inspection ******

West portal has collision damage above EBL. Used binoculars to look at area from deck. No cracks noted. Channel is bent inward, with yellow paint noted on member; peeling paint on back side of bend.

****** Notes from 2015 Routine Inspection ******

Stringers:

Section loss to flanges & webs of outside stringers in the end panels - esp. heavy @ corners - bottom flange SW has a 1" wide area of section loss - remaining steel tapers down to paper thin @ edge; holes thru webs of outside stringers @ corners: 3"x3"- SW & 1"x10"- SE; minor pitting & section loss to N. stringer in bay #2 from the East; Stringer #2 from the north on E. side of floor beam #4 - top flange damaged/torn down @ coped area (~2" tear).

Possible crack at the upper cope, at the east end of the north coping stringer, on the west side of the Floor Beam at L1, north truss, under the curb line. There is rust staining on the stringer that may indicate a crack, that may be +- 2" long. Will need to use the UB-40 to verify this. (This is NOT a Critical Finding).

Floor Beams:

Bottom flange has 1/4" section loss in bottom flange thickness (typical 1 1/8" thick now 7/8" for a 2" wide x 3" long area along the edge of the gusset plate - L3 of N. truss; Corrosion “hot spots” on top of bottom flange of floor beam #4 - 1/8” max. depth @ 1”x1” & 2”x2” areas on W. side, near the S. truss; Floor beam # 5 – moderate section loss @ bottom flange & web pitting near N. truss, minor section loss at edge of gusset @ S. truss; Floor beams #2 & 3 near N. truss – bottom flanges have areas of pitting (1/8” max. depth).

Verticals:

U4L4 of North truss - corrosion holes through outside channel ~ level with the deck - 1" & 2" diameter;

U2L2 of South truss - minor corrosion & pitting @ railing connection, 1 minor collision scrape - NW corner ~18" above railing;

U3L3 & U5L5 of South truss - lacing has minor corrosion on lower half of verticals;

U4L4 of South truss, U3L3 & U4L4 of North truss - minor pack rust between sway frame angles & verticals.

Diagonals:

NW & SE end posts have corrosion, pitting & minor section loss on the inside face of the outside channel sections.

U1L2 of North truss - 3 rivets have heavy corrosion & section loss bottom end on E. face;

U3L4 of North truss - outside flange has minor hot spots of corrosion on the bottom side;

U1L2 of South truss - hot spots of corrosion in the flange & web near lower chord & behind the railing - minor section loss heavier near lower chord;

U3L4 of South truss - 3 rivets have heavy corrosion & section loss on the outside flange;

U4L3 of South truss - ~4' long area of minor mill scale rusting near the bottom on the inside face of the outside flange.

Lower Chords:

Corrosion & section loss to lower chord splice plates (1/4” max. edge loss) - N. truss near L4 and S. truss near L2 & L4;

Pitting areas with minor section loss painted over are typical;

L0L1 of North truss - minor corrosion @ E. end top of web & flanges;

L1L2 of North truss - some pitting 1/8" deep, 1 small spot with corrosion inside flange near L2;

L2L3 of North truss- few small spots of pitting & section loss up to 1/8" deep on inside faces @ L3;

L6L7 of North truss - corrosion, pitting & minor section loss on top, below the NW end post;

L0L1 of South truss - a few hot spots of corrosion with minor section loss;

L2L3 of South truss - 3" diameter pitting area on the inside flange @ L3 - 1/8" deep section loss;

L3L4 of South truss - pitting & minor section loss (1/8” max. depth) - inside faces of flanges on top;

L6L7 of South truss - heavy corrosion below SE end post - flange up to 1/8" deep loss x1"x16" on inside flange, 1/4" loss x 2" dia. outside flange, 1/8"x1"x24" area near web.

Upper Chords and End Post:

Steel Lacings have corrosion & major section loss or are missing @ NW & SE end posts, (both L0-U1's), over the lower +- 8-feet.

All other Upper Chord Members looked to be in good condition, from the deck.

Gusset Plates:

Vertical Gusset Plates - connecting truss members:

All plates 3/8" thick, unless noted otherwise;

At L1 and L6, there are two individual plates, one on each side of the vertical;

L0 of North truss - fairly heavy corrosion & section loss near end of lower chord;

L2 of North truss - slight bowing of outside plate W. of vertical, 1/4" pack rust @ U2L2, pitting outside face over U2L2 near top of plate;

L3 of North truss - pitting & section loss painted over on inside plate W. of vertical;

L4 of North truss - minor outward bow of inside & outside plates on W.

side of vertical, pitting areas;

L5 of North truss - pitting & section loss 1/16" x 2" diameter @ end of U6L5 on the inside face of the inside plate W. of the vertical, pack rust bows outside plate out ~1/4" E. of vertical;

L6 of North truss - plate E. of vertical has 2" diameter hole (section loss), below centerline of rivets (see picture), 1/8" deep x 1" diameter pitting area between horizontal & vertical rivet lines;

L7 of North truss - heavy corrosion, minor section loss & pack rust near end of lower chord;

L0 of South truss - 15/32" thick - inside & outside plates, hot spots of corrosion @ SE end post, section loss areas - both plates, inside faces underneath LO-L1 member, near the east end of the LO-L1 rivets. Section loss is +- 60% over an area that is 3" high X 10" long, (this is NOT a Critical Finding);

L1 of South truss - minor corrosion @ edges;

L2 of South truss - minor outward bow of outside plate E. of vertical;

L3 of South truss - pitting & section loss @ end of U2L3 - W. of vertical;

L4 of South truss - pitting & minor section loss, minor corrosion & some pack rust between gusset plate & U5L4;

L5 of South truss - minor pitting, outside plate W. of vertical - edge bows out 1/4" due to pack rust;

L6 of South truss - pitting painted over W. of vertical;

L7 of South truss - minor pitting.

Connection plates:

There is 2- 1"x1" hole in the horizontal base plate in the NW & SW corner, at the corner of the railing post connection - seen by standing on top of the bridge, leaning over the railing & looking down.

Horizontal connection plates: moderate corrosion & section loss- esp. @ SE end post; pack rust causing some distortion between floor beams & gussets @ L2 of N. truss, L5 of S. truss and at both ends of floor beam #2 (L6 of N. truss & L1 of S. truss).

Lacings:

Steel Lacings have corrosion & fairly heavy section loss or are missing @ NW & SE end posts.

Rivets:

Heavy corrosion of rivets @ gusset plate in SE corner; other scattered rivets have some section loss.

Collision Damage:

Very minor impact damage to the East Portal.

Bearings:

The concrete support block for the east end floor beam has spalled in the support area. Steal Bearings are rusted, but OK.

Maintenance:

There are trees that protrude through the North Truss and over the north shoulder area, over the bridge deck. The leaves from these trees fall off and fill the lower truss chords all winter long. These trees should be cut way back from the truss. The truss needs to be cleaned out at least twice a year in order to prevent corrosion, so as to keep this bridge in service for many more years.

***** Gusset Plate Inspection on 09/13/2012 by RQAW *****

Jim Lesh of RQAW, Load Rated the Gusset Plates on 09/25/2012, after conducting a field inspection. Jeremy Hunter checked the calculations on 10/02/2012.

The RQAW Inspection Notes included the following:

North Truss -- there is bowing of the L4-L5 gusset plates. There is pack rust that has developed between the members and the gusset plates plate which has the caused gusset plate to warp. This warping will put tensile

stress into the rivets which decreases their shear capacity.

South Truss -- there is warping of the gusset plate at L-2.

From the analysis, it is noted that: the rows of rivets affected by the warping and prying action were removed from the gusset capacity checks for the corresponding members. These capacity reductions did not result in a governing load rating for this bridge.

The full Gusset Plate analysis report has been attached into "BIAS".

Inspector: Joshua Biller
Inspection Date: 10/13/2016

Asset Name: 026-38-03430 A
Facility Carried: SR 26

Bridge Inspection Report

IDENTIFICATION

(1) STATE CODE:	**185 - Indiana**
(8) STRUCTURE:	**007040**
(5 A-B-C-D-E) INV. ROUTE:	**1 - 3 - 1 - 00026 - 0**
(2) HIGHWAY AGENCY DISTRICT:	**03 - Greenfield**
(3) COUNTY CODE:	**038 - JAY**
(4) PLACE CODE:	**61236 - PORTLAND**
(6) FEATURES INTERSECTED:	**SALAMONIE RIVER**
(7) FACILITY CARRIED:	**SR 26**
(9) LOCATION:	**00.78 E US 27**
(11) MILEPOINT:	**0014.300**

(12) BASE HIGHWAY NETWORK:	**0**
(13A) INVENTORY ROUTE:	
(13B) SUBROUTE NUMBER:	
(16) LATITUDE:	**40.43255**
(17) LONGITUDE:	**-84.963486**
(98) BORDER	
A) STATE NAME:	
B) PERCENT	**%**
(99) BORDER BRIDGE STRUCT. NO:	

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN:	
A) KIND OF MATERIAL/DESIGN:	**3 - Steel**
B) TYPE OF DESIGN/CONSTR:	**10 - Truss - Thru**
(44) STRUCTURE TYPE, APPROACH SPANS:	
A) KIND OF MATERIAL/DESIGN:	**0 - Other**
B) TYPE OF DESIGN/CONSTR:	**00 - Other**

(45) NUMBER OF SPANS IN MAIN UNIT:	**001**
(46) NUMBER OF APPROACH SPANS:	**0000**
(107) DECK STRUCTURE TYPE:	**1 - Concrete Cast-in-Place**
(108) WEARING SURFACE/PROT SYS:	
A) WEARING SURFACE:	**3 - Latex Concrete or similar additive**
B) DECK MEMBRANE:	**0 - None**
C) DECK PROTECTION:	**0 - None**

AGE OF SERVICE

(27) YEAR BUILT:	**1941**
(106) YEAR RECONSTRUCTED:	**1979**
(42) TYPE OF SERVICE:	
A) ON BRIDGE:	**1 - Highway**
B) UNDER BRIDGE:	**5 - Waterway**

(28) LANES:	
A) ON BRIDGE:	**02**
B) UNDER BRIDGE:	**00**
(29) AVERAGE DAILY TRAFFIC:	**002541**
(30) YEAR OF AVERAGE DAILY TRAFFIC:	**2014**
(109) AVERAGE DAILY TRUCK TRAFFIC:	**16 %**
(19) BYPASS DETOUR LENGTH:	**003 MI**

Inspector: Joshua Biller
Inspection Date: 10/13/2016
Asset Name: 026-38-03430 A
Facility Carried: SR 26

Bridge Inspection Report

GEOMETRIC DATA

(48) LENGTH OF MAX SPAN:	**0150.0 FT**
(49) STRUCTURE LENGTH:	**00154.7 FT**
(50) CURB/SIDEWALK WIDTHS:	
A) LEFT	**00.5 FT**
B) RIGHT:	**00.5 FT**
(51) BRDG RDWY WIDTH CURB-TO-CURB:	**028.0 FT**
(52) DECK WIDTH, OUT-TO-OUT:	**029.0 FT**
(32) APPROACH ROADWAY	**028.0 FT**
(33) BRIDGE MEDIAN:	**0 - No median**
(34) SKEW:	**00 DEG**

(35) STRUCTURE FLARED:	**0 - No flare**
(10) INV RTE, MIN VERT CLEARANCE:	**15.00 FT**
(47) TOT HORIZ CLEARANCE:	**028.0 FT**
(53) VERT CLEAR OVER BR RDWY:	**14.92 FT**
(54) MIN VERTICAL UNDERCLEARANCE:	
A) REFERENCE FEATURE:	**N**
B) MIN VERT UNDERCLEAR:	**00.00 FT**
(55) LATERAL UNDERCLEARANCE RIGHT:	
A) REFERENCE FEATURE:	**N**
B) MIN LATERAL UNDERCLEAR:	**000.0 FT**
(56) MIN LATERAL UNDERCLEAR ON LEFT:	**000.0 FT**

INSPECTIONS

(90) INSPECTION DATE:	**10/13/2016**
(92) CRITICAL FEATURE INSPECTION:	
A) FRACTURE CRITICAL REQUIRED/FREQUENCY:	**Y 24**
B) UNDERWATER INSPECTION REQUIRED/FREQUENCY:	**N**
C) OTHER SPECIAL INSPECTION REQUIRED/FREQUENCY:	**N**

(91) DESIGNATED INSPECTION FREQUENCY:	**24 MONTHS**
(93) CRITICAL FEATURE INSPECTION DATE:	
A) FRACTURE CRITICAL DATE:	**08/27/2015**
B) UNDERWATER INSP DATE:	
C) OTHER SPECIAL INSP DATE:	

CONDITION

(58) DECK:	**5 - Fair Condition (minor section loss)**
(58.01) WEARING SURFACE:	**5 - Fair Condition**
(59) SUPERSTRUCTURE:	**5 - Fair Condition (minor section loss)**

(60) SUBSTRUCTURE:	**5 - Fair Condition (minor section loss)**
(61) CHANNEL/CHANNEL PROTECTION:	**5 - Bank eroded.. major damage**
(62) CULVERTS:	**N - Not Applicable**

CONDITION COMMENTS

(58) DECK: **5 - Fair Condition (minor section loss)**

Comments:
Deck (underside) has corrosion to metal (SIP) forms - several areas of heavy corrosion at the corners, especially at the NE end of the deck, and along the edges of the Floor Beam upper flanges, near the copings.

Concrete Copings have minor spalls, with narrow vertical & horizontal cracks.

Steel bridge railing has corrosion at connections & section loss holes - SE & NW; minor collision rubs & scratches on both railings; 2 railing bolts sheared off on the back side of the first vertical @ NE corner

(58.01) WEARING SURFACE: 5 - Fair Condition

Comments:
Wearing surface has numerous narrow transverse cracks over each interior Floor Beam. Usually two or three parallel transverse cracks with random map cracking propagating out. A few hailrine longitudinal cracks at the west end of the deck. One concrete patch in the WBL at east end. Three concrete patches in the EBL, near mid-span. A drain grate along the north curb line has been replaced with a steel plate.

(59) SUPERSTRUCTURE: 5 - Fair Condition (minor section loss)

Comments:
See the 08/27/2015 Fracture Critical Inspection Report for more details. Inspection used Standard No. 1522 to identify the truss panel points (labeled left-to-right from roadway side of each truss). L0-X is in SE corner of bridge; L0-Y is in NW corner of bridge. South is "X" truss, north is "Y" truss, Floor Beam 1 is on west end, Floor Beam 8 is on east end, Stringer1 is on south side, and Stringer10 is on north side. Deterioration (loss of lacing on end posts, corrosion of gusset plates) in SE & NW corners are of particular concern. Noticeable vertical and lateral movement under live loading, with booms/bangs heard at ends of deck (likely from loose joints and/or floor beams tapping support blocks).

See the Executive Summary for general comments/notes on superstructure members.

(60) SUBSTRUCTURE: 5 - Fair Condition (minor section loss)

Comments:
Breastwalls have wide vertical and horizontal cracks; delaminations & spalls in re-pointed areas, both E & W Abutments, worse at the East Abutment, due to water leakage through the BS joint.

Concrete Caps and Backwalls have minor vertical cracks.

Erosion at corners - concrete turnout/paved side ditch undermined, cracked & settled @ NE & SE corners; ponding at the west abutment; fairly deep erosion gulleys on both banks below bridge.

(61) CHANNEL/CHANNEL PROTECTION 5 - Bank eroded.. major damage

Comments:
Channel has very heavy bank erosion, many downed trees and exposed roots.

Evidence of highwater above the lower chord - see pictures (8/9/11).

No rip rap or other channel protection at or nearby the bridge. - No evidence of channel scour.

(62) CULVERTS: N - Not Applicable

Comments:

LOAD RATING AND POSTING

(31) DESIGN LOAD:	**4 - H 20**	(66) INVENTORY RATING:	**29**
(70) BRIDGE POSTING	**5 - Equal to or above legal loads**	(65) INVENTORY RATING METHOD:	**1 - Load Factor (LF)**
		(66B) INVENTORY RATING (H):	**18**
(41) STRUCTURE OPEN/POSTED/CLOSED:	**A - Open**	(66D) DATE POSTED/CLOSED:	
(64) OPERATING RATING:	**49**		
(63) OPERATING RATING METHOD:	**1 - Load Factor (LF)**		

Inspector: Joshua Biller
Inspection Date: 10/13/2016

Asset Name: 026-38-03430 A
Facility Carried: SR 26

Bridge Inspection Report

APPRAISAL

SUFFICIENCY RATING:	**64.7**
STATUS:	**0**
(67) STRUCTURAL EVALUATION:	**5**
(68) DECK GEOMETRY:	**4**
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL:	**N**

(36) TRAFFIC SAFETY FEATURE:	
36A) BRIDGE RAILINGS:	**0**
36B) TRANSITIONS:	**0**
36C) APPROACH GUARDRAIL:	**0**
36D) APPROACH GUARDRAIL ENDS:	**0**

(71) WATERWAY ADEQUACY: **9 - Bridge Above Flood Water Elevations**

Comments:
~4' max. HW to E. approach PG.

Evidence of highwater above the lower chord - see pictures (8/9/11).

(72) APPROACH ROADWAY ALIGNMENT: **8 - Equal to present desirable criteria**

Comments:
Good. SR-26 is straight and flat on both sides of the bridge.

Approach slabs have wide longitudinal cracks along center construction joint.
Approach guardrail is substandard - aluminum; leaning outward.
Approach pavement has wide random cracks & minor rutting; wedges replaced in 2000.
West Shoulders failing.
Narrow shoulders all sides. Little room to park inspection vehicles.

(113) SCOUR CRITICAL BRIDGES: **8 - Stable for scour conditions**

Comments:
Spread Footings, ON Piles, at both Abutments.

Bottom of Footing elevation = 75.77' at West Abutment.
Bottom of Footing elevation = 75.02' at East Abutment.

The 1941 Flow Line elevation = 78.80'
The 1933 High Water elevation = 94.80'

Soil is sand and clay over gravel

CLASSIFICATION

(20) TOLL:	**3 - On Free Road**
(22) OWNER:	**01 - State Highway Agency**
(37) HISTORICAL SIGNIFICANCE:	**2 - Eligible for National Register**
(101) PARALLEL STRUCTURE:	**N - No parallel structure**
(103) TEMPORARY STRUCTURE:	
(105) FEDERAL LANDS HIGHWAYS:	**0-Not Applicable**
(112) NBIS BRIDGE LENGTH:	**Yes**

(21) MAINT. RESPONSIBILITY:	**01 - State Highway Agency**
(26) FUNCTIONAL CLASS OF INVENTORY RTE:	**16 - Urban - Minor Arterial**
(100) STRAHNET HIGHWAY:	**Not a STRAHNET route**
(102) DIRECTION OF TRAFFIC:	**2-way traffic**
(104) HIGHWAY SYSTEM OF INVENTORY ROUTE:	**0 - Structure/Route is NOT on NHS**
(110) DESIGNATED NATIONAL NETWORK:	**Inventory route on National Truck Network**

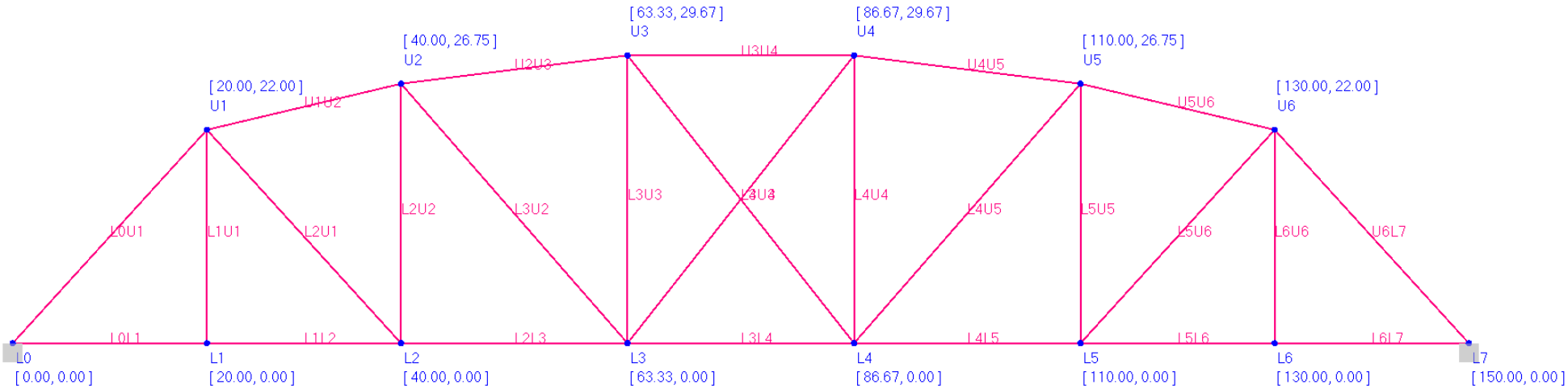
NAVIGATION DATA

(38) NAVIGATION CONTROL:	**0 - No navigation control on waterway (bridge permit not required)**	(39) NAVIGATION VERTICAL CLEAR:	**000.0 FT**
		(116) MINIMUM NAVIGATION VERT. CLEARANCE, VERT. LIFT BRIDGE:	**FT**
(111) PIER OR ABUTMENT PROTECTION:		(40) NAV HORIZONTAL CLEARANCE:	**0000.0 FT**

PROPOSED IMPROVEMENTS

(75A) TYPE OF WORK:	**38 - Other Structural Work**	(95) ROADWAY IMPROVEMENT COST:	**$ 000000**
(75B) WORK DONE BY:	**1 - Work to be done by contract**	(96) TOTAL PROJECT COST:	**$ 000116**
(76) LENGTH OF IMPROVEMENT:	**000154. FT 7**	(97) YR OF IMPROVEMENT COST EST:	**2015**
		(114) FUTURE AVG DAILY TRAFFIC:	**004600**
(94) BRIDGE IMPROVEMENT COST:	**$ 000116**	(115) YR OF FUTURE ADT:	**2030**

Appendix F
Load Rating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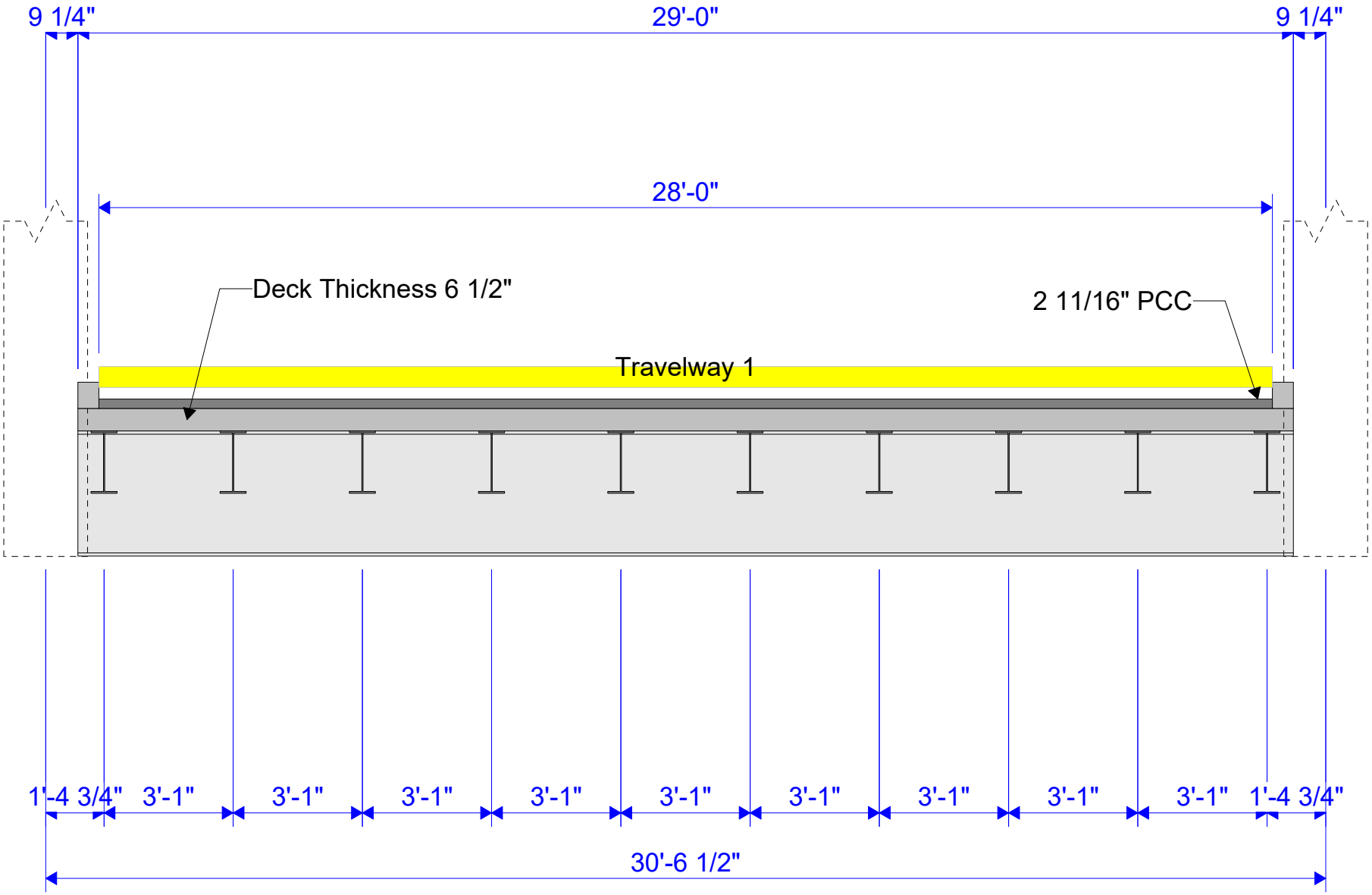
V
T
L

North

026-38-03430 A Gusset-Det
NBI=007040 (STT) - 7 Panel Steel Truss
03/23/18



Notes:
* The truss members are not drawn to scale.

Bridge ID :026-38-03430AGusset-Det
Bridge : NBI=007040 (STT)
StructDef : 7PanelSteelTruss
User : Bridge
Date : Thursday, March 22, 2018 16:35:43
File : RatingResults.XML
Analysis Preference Setting : None

NBI Structure ID :007040
Bridge Alt :
Member : North

Overall Load Factor Rating Summary

Live Load	Live Load Type	Inv Element	Inv RF	Inv Capacity (Ton)	Opr Element	Opr RF	Opr Capacity (Ton)	Legal Opr Element	Legal Opr RF	Legal Opr Capacity (Ton)	Permit Inv Element	Permit Inv RF	Permit Inv Capacity (Ton)	Permit Opr Element	Permit Opr RF	Permit Opr Capacity (Ton)	Impact	Lane
H 20-44 - Lane	Design Lane	L6U6	**0.885**	17.70	L6U6	1.478	29.56										As Requested	As Requested
H 20-44 - Lane	Design Lane	L6U6	**0.885**	17.70	L6U6	1.478	29.56										With Impact	Multi-Lane
H 20-44 - Truck	Design Truck	L6U6	**0.998**	19.96	L6U6	1.667	33.34										As Requested	As Requested
H 20-44 - Truck	Design Truck	L6U6	**0.998**	19.96	L6U6	1.667	33.34										With Impact	Multi-Lane
HS 20-44 - Lane	Design Lane	L6U6	**0.885**	31.86	L6U6	1.478	53.20										As Requested	As Requested
HS 20-44 - Lane	Design Lane	L6U6	**0.885**	31.86	L6U6	1.478	53.20										With Impact	Multi-Lane
HS 20-44 - Truck	Design Truck	L6U6	**0.780**	28.09	L6U6	1.303	46.91										As Requested	As Requested
HS 20-44 - Truck	Design Truck	L6U6	**0.780**	28.09	L6U6	1.303	46.91										With Impact	Multi-Lane

Live Load: H 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force Comp. (kip)	IF	Tens. (kip)	IF	Capacity Comp. (kip)	Capacity Tens. (kip)	Adj Veh Demand Comp. (kip)	Adj Veh Demand Tens. (kip)	One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
L0L1	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L1L2	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L2L3	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L3L4	Lower-Chord	257.31			76.36	1.18		633.27				1.262	1.208	2.018			
L4L5	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L5L6	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L6L7	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
U1U2	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
U2U3	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U3U4	Upper-Chord	-268.72	-80.48	1.18			-672.28					1.262	1.239	2.070			
U4U5	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U5U6	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
L1U1	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			
L2U2	Vertical	-17.65	-21.17	1.23	22.76	1.28	-223.00	223.00				1.262	2.813	4.698			
L3U3	Vertical	19.29	-6.49	1.26	17.01	1.24	-202.00	202.00				1.262	3.052	5.098			
L4U4	Vertical	19.29	-6.49	1.26	17.01	1.24	-223.00	223.00				1.262	3.415	5.703			
L5U5	Vertical	-17.65	-21.17	1.23	22.76	1.28	-223.00	222.75				1.262	2.813	4.698			
L6U6	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

L0U1	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
U6L7	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
L2U1	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			
L3U2	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.510	2.522			
L4U3	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	148.00				1.262	2.400	4.008			
L3U4	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.400	4.008			
L4U5	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.510	2.522			
L5U6	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: H 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	167.49			30.84	1.18		442.53				1.262	2.251	3.760			
L1L2	Lower-Chord	167.49			30.84	1.18		442.53				1.262	2.251	3.760			
L2L3	Lower-Chord	233.43			42.75	1.18		591.69				1.262	2.082	3.478			
L3L4	Lower-Chord	257.31			41.58	1.18		633.27				1.262	2.219	3.706			
L4L5	Lower-Chord	233.43			42.75	1.18		591.69				1.262	2.082	3.478			
L5L6	Lower-Chord	167.49			30.84	1.18		442.53				1.262	2.251	3.760			
L6L7	Lower-Chord	167.49			30.84	1.18		442.53				1.262	2.251	3.760			
U1U2	Upper-Chord	-239.93	-43.94	1.18			-682.00					1.262	2.602	4.345			
U2U3	Upper-Chord	-265.06	-48.12	1.18			-671.60					1.262	2.099	3.505			
U3U4	Upper-Chord	-268.72	-43.82	1.18			-672.28					1.262	2.276	3.801			
U4U5	Upper-Chord	-265.06	-48.12	1.18			-671.60					1.262	2.099	3.505			
U5U6	Upper-Chord	-239.93	-43.94	1.18			-682.00					1.262	2.602	4.345			
L1U1	Vertical	49.01			34.40	1.30		186.00				1.262	**0.998**	1.667			
L2U2	Vertical	-17.65	-14.42	1.23	19.61	1.28	-223.00	223.00				1.262	3.500	5.845			
L3U3	Vertical	19.29	-5.12	1.26	12.61	1.24	-202.00	202.00				1.262	4.118	6.877			
L4U4	Vertical	19.29	-5.12	1.26	12.61	1.24	-223.00	223.00				1.262	4.607	7.693			
L5U5	Vertical	-17.65	-14.42	1.23	19.61	1.28	-223.00	222.75				1.262	3.496	5.839			
L6U6	Vertical	49.01			34.40	1.30		186.00				1.262	**0.998**	1.667			
L0U1	Diagonal	-248.99	-45.84	1.18			-631.00					1.262	2.070	3.457			
U6L7	Diagonal	-248.99	-45.84	1.18			-631.00					1.262	2.070	3.457			
L2U1	Diagonal	98.03	-12.25	1.30	24.91	1.20	-162.07	260.00				1.262	1.616	2.699			
L3U2	Diagonal	45.01	-17.97	1.28	21.76	1.22	-202.53	222.75				1.262	2.253	3.762			
L4U3	Diagonal	9.23	-8.54	1.25	12.00	1.25	-81.56	148.00				1.262	3.099	5.175			
L3U4	Diagonal	9.23	-8.54	1.25	12.00	1.25	-81.56	159.39				1.262	3.099	5.175			
L4U5	Diagonal	45.01	-17.97	1.28	21.76	1.22	-202.53	222.75				1.262	2.253	3.762			
L5U6	Diagonal	98.03	-12.25	1.30	24.91	1.20	-162.07	260.00				1.262	1.616	2.699			

Support	LL Reaction (kip)	I.F.

Support	LL Reaction (kip)	I.F.
L0	39.25	1.18
L7	39.25	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L1L2	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L2L3	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L3L4	Lower-Chord	257.31			76.36	1.18		633.27				1.262	1.208	2.018			
L4L5	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L5L6	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L6L7	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
U1U2	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
U2U3	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U3U4	Upper-Chord	-268.72	-80.48	1.18			-672.28					1.262	1.239	2.070			
U4U5	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U5U6	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
L1U1	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			
L2U2	Vertical	-17.65	-21.17	1.23	22.76	1.28	-223.00	223.00				1.262	2.813	4.698			
L3U3	Vertical	19.29	-6.49	1.26	17.01	1.24	-202.00	202.00				1.262	3.052	5.098			
L4U4	Vertical	19.29	-6.49	1.26	17.01	1.24	-223.00	223.00				1.262	3.415	5.703			
L5U5	Vertical	-17.65	-21.17	1.23	22.76	1.28	-223.00	222.75				1.262	2.813	4.698			
L6U6	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			
L0U1	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
U6L7	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
L2U1	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			
L3U2	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.510	2.522			
L4U3	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	148.00				1.262	2.400	4.008			
L3U4	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.400	4.008			
L4U5	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.510	2.522			
L5U6	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	167.49			52.65	1.18		442.53				1.262	1.318	2.202			
L1L2	Lower-Chord	167.49			52.65	1.18		442.53				1.262	1.318	2.202			
L2L3	Lower-Chord	233.43			72.25	1.18		591.69				1.262	1.232	2.057			
L3L4	Lower-Chord	257.31			74.22	1.18		633.27				1.262	1.243	2.076			
L4L5	Lower-Chord	233.43			72.25	1.18		591.69				1.262	1.232	2.057			
L5L6	Lower-Chord	167.49			52.65	1.18		442.53				1.262	1.318	2.202			
L6L7	Lower-Chord	167.49			52.65	1.18		442.53				1.262	1.318	2.202			
U1U2	Upper-Chord	-239.93	-74.26	1.18			-682.00					1.262	1.539	2.570			
U2U3	Upper-Chord	-265.06	-80.88	1.18			-671.60					1.262	1.249	2.085			
U3U4	Upper-Chord	-268.72	-78.22	1.18			-672.28					1.262	1.275	2.129			
U4U5	Upper-Chord	-265.06	-80.88	1.18			-671.60					1.262	1.249	2.085			
U5U6	Upper-Chord	-239.93	-74.26	1.18			-682.00					1.262	1.539	2.570			
L1U1	Vertical	49.01			44.00	1.30		186.00				1.262	**0.780**	1.303			
L2U2	Vertical	-17.65	-23.94	1.23	29.10	1.28	-223.00	223.00				1.262	2.359	3.939			
L3U3	Vertical	19.29	-8.23	1.26	20.24	1.24	-202.00	202.00				1.262	2.564	4.283			
L4U4	Vertical	19.29	-8.23	1.26	20.24	1.24	-223.00	223.00				1.262	2.869	4.791			
L5U5	Vertical	-17.65	-23.94	1.23	29.10	1.28	-223.00	222.75				1.262	2.356	3.935			
L6U6	Vertical	49.01			44.00	1.30		186.00				1.262	**0.780**	1.303			
L0U1	Diagonal	-248.99	-78.28	1.18			-631.00					1.262	1.212	2.025			
U6L7	Diagonal	-248.99	-78.28	1.18			-631.00					1.262	1.212	2.025			
L2U1	Diagonal	98.03	-14.82	1.30	42.11	1.20	-162.07	260.00				1.262	**0.956**	1.597			
L3U2	Diagonal	45.01	-26.67	1.28	36.11	1.22	-202.53	222.75				1.262	1.357	2.267			
L4U3	Diagonal	9.23	-13.71	1.25	19.27	1.25	-81.56	148.00				1.262	1.930	3.223			
L3U4	Diagonal	9.23	-13.71	1.25	19.27	1.25	-81.56	159.39				1.262	1.930	3.223			
L4U5	Diagonal	45.01	-26.67	1.28	36.11	1.22	-202.53	222.75				1.262	1.357	2.267			
L5U6	Diagonal	98.03	-14.82	1.30	42.11	1.20	-162.07	260.00				1.262	**0.956**	1.597			

Support	LL Reaction (kip)	I.F.
L0	67.52	1.18
L7	67.52	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Bridge ID :026-38-03430AGusset-Det
Bridge : NBI=007040 (STT)
StructDef : 7PanelSteelTruss
User : Bridge
Date : Thursday, March 22, 2018 16:35:46
File : RatingResults.XML
Analysis Preference Setting : None

NBI Structure ID :007040
Bridge Alt :
Member : South

Overall Load Factor Rating Summary

Live Load	Live Load Type	Inv Element	Inv RF	Inv Capacity (Ton)	Opr Element	Opr RF	Opr Capacity (Ton)	Legal Opr Element	Legal Opr RF	Legal Opr Capacity (Ton)	Permit Inv Element	Permit Inv RF	Permit Inv Capacity (Ton)	Permit Opr Element	Permit Opr RF	Permit Opr Capacity (Ton)	Impact	Lane
H 20-44 - Lane	Design Lane	L6L7	**0.809**	16.19	L6L7	1.351	27.03										As Requested	As Requested
H 20-44 - Lane	Design Lane	L6L7	**0.809**	16.19	L6L7	1.351	27.03										With Impact	Multi-Lane
H 20-44 - Truck	Design Truck	L6U6	**0.998**	19.96	L6U6	1.667	33.34										As Requested	As Requested
H 20-44 - Truck	Design Truck	L6U6	**0.998**	19.96	L6U6	1.667	33.34										With Impact	Multi-Lane
HS 20-44 - Lane	Design Lane	L6L7	**0.809**	29.13	L6L7	1.351	48.65										As Requested	As Requested
HS 20-44 - Lane	Design Lane	L6L7	**0.809**	29.13	L6L7	1.351	48.65										With Impact	Multi-Lane
HS 20-44 - Truck	Design Truck	L6U6	**0.780**	28.09	L6U6	1.303	46.91										As Requested	As Requested
HS 20-44 - Truck	Design Truck	L6U6	**0.780**	28.09	L6U6	1.303	46.91										With Impact	Multi-Lane

Live Load: H 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force Comp. (kip)	IF	LL Force Tens. (kip)	IF	Capacity Comp. (kip)	Capacity Tens. (kip)	Adj Veh Demand Comp. (kip)	Adj Veh Demand Tens. (kip)	One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
L0L1	Lower-Chord	167.49			52.00	1.18		398.00				1.262	1.071	1.788			
L1L2	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L2L3	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L3L4	Lower-Chord	257.31			76.36	1.18		633.27				1.262	1.208	2.018			
L4L5	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L5L6	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L6L7	Lower-Chord	167.49			52.00	1.18		354.00				1.262	**0.809**	1.351			
U1U2	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
U2U3	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U3U4	Upper-Chord	-268.72	-80.48	1.18			-672.28					1.262	1.239	2.070			
U4U5	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U5U6	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
L1U1	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			
L2U2	Vertical	-17.65	-21.17	1.23	22.76	1.28	-202.00	202.00				1.262	2.518	4.205			
L3U3	Vertical	19.29	-6.49	1.26	17.01	1.24	-217.41	219.78				1.262	3.359	5.610			
L4U4	Vertical	19.29	-6.49	1.26	17.01	1.24	-223.00	223.00				1.262	3.415	5.703			
L5U5	Vertical	-17.65	-21.17	1.23	22.76	1.28	-223.00	219.78				1.262	2.813	4.698			
L6U6	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

L0U1	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
U6L7	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
L2U1	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			
L3U2	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.483	2.476			
L4U3	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	148.00				1.262	2.400	4.008			
L3U4	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.400	4.008			
L4U5	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.483	2.476			
L5U6	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: H 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	167.49			30.84	1.18		398.00				1.262	1.805	3.015			
L1L2	Lower-Chord	167.49			30.84	1.18		442.53				1.262	2.251	3.760			
L2L3	Lower-Chord	233.43			42.75	1.18		591.69				1.262	2.082	3.478			
L3L4	Lower-Chord	257.31			41.58	1.18		633.27				1.262	2.219	3.706			
L4L5	Lower-Chord	233.43			42.75	1.18		591.69				1.262	2.082	3.478			
L5L6	Lower-Chord	167.49			30.84	1.18		442.53				1.262	2.251	3.760			
L6L7	Lower-Chord	167.49			30.84	1.18		354.00				1.262	1.365	2.279			
U1U2	Upper-Chord	-239.93	-43.94	1.18			-682.00					1.262	2.602	4.345			
U2U3	Upper-Chord	-265.06	-48.12	1.18			-671.60					1.262	2.099	3.505			
U3U4	Upper-Chord	-268.72	-43.82	1.18			-672.28					1.262	2.276	3.801			
U4U5	Upper-Chord	-265.06	-48.12	1.18			-671.60					1.262	2.099	3.505			
U5U6	Upper-Chord	-239.93	-43.94	1.18			-682.00					1.262	2.602	4.345			
L1U1	Vertical	49.01			34.40	1.30		186.00				1.262	**0.998**	1.667			
L2U2	Vertical	-17.65	-14.42	1.23	19.61	1.28	-202.00	202.00				1.262	3.195	5.335			
L3U3	Vertical	19.29	-5.12	1.26	12.61	1.24	-217.41	219.78				1.262	4.532	7.568			
L4U4	Vertical	19.29	-5.12	1.26	12.61	1.24	-223.00	223.00				1.262	4.607	7.693			
L5U5	Vertical	-17.65	-14.42	1.23	19.61	1.28	-223.00	219.78				1.262	3.453	5.767			
L6U6	Vertical	49.01			34.40	1.30		186.00				1.262	**0.998**	1.667			
L0U1	Diagonal	-248.99	-45.84	1.18			-631.00					1.262	2.070	3.457			
U6L7	Diagonal	-248.99	-45.84	1.18			-631.00					1.262	2.070	3.457			
L2U1	Diagonal	98.03	-12.25	1.30	24.91	1.20	-162.07	260.00				1.262	1.616	2.699			
L3U2	Diagonal	45.01	-17.97	1.28	21.76	1.22	-202.53	219.78				1.262	2.212	3.694			
L4U3	Diagonal	9.23	-8.54	1.25	12.00	1.25	-81.56	148.00				1.262	3.099	5.175			
L3U4	Diagonal	9.23	-8.54	1.25	12.00	1.25	-81.56	159.39				1.262	3.099	5.175			
L4U5	Diagonal	45.01	-17.97	1.28	21.76	1.22	-202.53	219.78				1.262	2.212	3.694			
L5U6	Diagonal	98.03	-12.25	1.30	24.91	1.20	-162.07	260.00				1.262	1.616	2.699			

Support	LL Reaction (kip)	I.F.

Support	LL Reaction (kip)	I.F.
L0	39.25	1.18
L7	39.25	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	167.49			52.00	1.18		398.00				1.262	1.071	1.788			
L1L2	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L2L3	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L3L4	Lower-Chord	257.31			76.36	1.18		633.27				1.262	1.208	2.018			
L4L5	Lower-Chord	233.43			72.37	1.18		591.69				1.262	1.230	2.054			
L5L6	Lower-Chord	167.49			52.00	1.18		442.53				1.262	1.335	2.230			
L6L7	Lower-Chord	167.49			52.00	1.18		354.00				1.262	**0.809**	1.351			
U1U2	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
U2U3	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U3U4	Upper-Chord	-268.72	-80.48	1.18			-672.28					1.262	1.239	2.070			
U4U5	Upper-Chord	-265.06	-82.04	1.18			-671.60					1.262	1.231	2.056			
U5U6	Upper-Chord	-239.93	-74.39	1.18			-682.00					1.262	1.537	2.566			
L1U1	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			
L2U2	Vertical	-17.65	-21.17	1.23	22.76	1.28	-202.00	202.00				1.262	2.518	4.205			
L3U3	Vertical	19.29	-6.49	1.26	17.01	1.24	-217.41	219.78				1.262	3.359	5.610			
L4U4	Vertical	19.29	-6.49	1.26	17.01	1.24	-223.00	223.00				1.262	3.415	5.703			
L5U5	Vertical	-17.65	-21.17	1.23	22.76	1.28	-223.00	219.78				1.262	2.813	4.698			
L6U6	Vertical	49.01			38.80	1.30		186.00				1.262	**0.885**	1.478			
L0U1	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
U6L7	Diagonal	-248.99	-86.67	1.18			-631.00					1.262	1.095	1.829			
L2U1	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			
L3U2	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.483	2.476			
L4U3	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	148.00				1.262	2.400	4.008			
L3U4	Diagonal	9.23	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.400	4.008			
L4U5	Diagonal	45.01	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.483	2.476			
L5U6	Diagonal	98.03	-12.36	1.30	41.74	1.20	-162.07	260.00				1.262	**0.965**	1.611			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	167.49			52.65	1.18		398.00				1.262	1.057	1.766			
L1L2	Lower-Chord	167.49			52.65	1.18		442.53				1.262	1.318	2.202			
L2L3	Lower-Chord	233.43			72.25	1.18		591.69				1.262	1.232	2.057			
L3L4	Lower-Chord	257.31			74.22	1.18		633.27				1.262	1.243	2.076			
L4L5	Lower-Chord	233.43			72.25	1.18		591.69				1.262	1.232	2.057			
L5L6	Lower-Chord	167.49			52.65	1.18		442.53				1.262	1.318	2.202			
L6L7	Lower-Chord	167.49			52.65	1.18		354.00				1.262	**0.799**	1.335			
U1U2	Upper-Chord	-239.93	-74.26	1.18			-682.00					1.262	1.539	2.570			
U2U3	Upper-Chord	-265.06	-80.88	1.18			-671.60					1.262	1.249	2.085			
U3U4	Upper-Chord	-268.72	-78.22	1.18			-672.28					1.262	1.275	2.129			
U4U5	Upper-Chord	-265.06	-80.88	1.18			-671.60					1.262	1.249	2.085			
U5U6	Upper-Chord	-239.93	-74.26	1.18			-682.00					1.262	1.539	2.570			
L1U1	Vertical	49.01			44.00	1.30		186.00				1.262	**0.780**	1.303			
L2U2	Vertical	-17.65	-23.94	1.23	29.10	1.28	-202.00	202.00				1.262	2.153	3.595			
L3U3	Vertical	19.29	-8.23	1.26	20.24	1.24	-217.41	219.78				1.262	2.822	4.713			
L4U4	Vertical	19.29	-8.23	1.26	20.24	1.24	-223.00	223.00				1.262	2.869	4.791			
L5U5	Vertical	-17.65	-23.94	1.23	29.10	1.28	-223.00	219.78				1.262	2.327	3.886			
L6U6	Vertical	49.01			44.00	1.30		186.00				1.262	**0.780**	1.303			
L0U1	Diagonal	-248.99	-78.28	1.18			-631.00					1.262	1.212	2.025			
U6L7	Diagonal	-248.99	-78.28	1.18			-631.00					1.262	1.212	2.025			
L2U1	Diagonal	98.03	-14.82	1.30	42.11	1.20	-162.07	260.00				1.262	**0.956**	1.597			
L3U2	Diagonal	45.01	-26.67	1.28	36.11	1.22	-202.53	219.78				1.262	1.333	2.226			
L4U3	Diagonal	9.23	-13.71	1.25	19.27	1.25	-81.56	148.00				1.262	1.930	3.223			
L3U4	Diagonal	9.23	-13.71	1.25	19.27	1.25	-81.56	159.39				1.262	1.930	3.223			
L4U5	Diagonal	45.01	-26.67	1.28	36.11	1.22	-202.53	219.78				1.262	1.333	2.226			
L5U6	Diagonal	98.03	-14.82	1.30	42.11	1.20	-162.07	260.00				1.262	**0.956**	1.597			

Support	LL Reaction (kip)	I.F.
L0	67.52	1.18
L7	67.52	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Bridge ID :026-38-03430AGusset-Det
Bridge : NBI=007040 (STT)
StructDef : Nodamage7PanelSteelTruss
User : Bridge
Date : Friday, March 23, 2018 09:19:31
File : RatingResults.XML
Analysis Preference Setting : None

NBI Structure ID :007040
Bridge Alt :
Member : North

Overall Load Factor Rating Summary

Live Load	Live Load Type	Inv Element	Inv RF	Inv Capacity (Ton)	Opr Element	Opr RF	Opr Capacity (Ton)	Legal Opr Element	Legal Opr RF	Legal Opr Capacity (Ton)	Permit Inv Element	Permit Inv RF	Permit Inv Capacity (Ton)	Permit Opr Element	Permit Opr RF	Permit Opr Capacity (Ton)	Impact	Lane
H 20-44 - Lane	Design Lane	L3L4	1.060	21.20	L3L4	1.770	35.40										As Requested	As Requested
H 20-44 - Lane	Design Lane	L3L4	1.060	21.20	L3L4	1.770	35.40										With Impact	Multi-Lane
H 20-44 - Truck	Design Truck	L6U6	1.563	31.26	L6U6	2.610	52.20										As Requested	As Requested
H 20-44 - Truck	Design Truck	L6U6	1.563	31.26	L6U6	2.610	52.20										With Impact	Multi-Lane
HS 20-44 - Lane	Design Lane	L3L4	1.060	38.16	L3L4	1.770	63.73										As Requested	As Requested
HS 20-44 - Lane	Design Lane	L3L4	1.060	38.16	L3L4	1.770	63.73										With Impact	Multi-Lane
HS 20-44 - Truck	Design Truck	L2L3	1.089	39.20	L2L3	1.818	65.46										As Requested	As Requested
HS 20-44 - Truck	Design Truck	L2L3	1.089	39.20	L2L3	1.818	65.46										With Impact	Multi-Lane

Live Load: H 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force Comp. (kip)	IF	LL Force Tens. (kip)	IF	Capacity Comp. (kip)	Capacity Tens. (kip)	Adj Veh Demand Comp. (kip)	Adj Veh Demand Tens. (kip)	One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
L0L1	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L1L2	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L2L3	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L3L4	Lower-Chord	285.52			76.36	1.18		633.27				1.262	1.060	1.770			
L4L5	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L5L6	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L6L7	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
U1U2	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
U2U3	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U3U4	Upper-Chord	-298.45	-80.48	1.18			-672.28					1.262	1.091	1.822			
U4U5	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U5U6	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
L1U1	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			
L2U2	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	222.75				1.262	2.804	4.682			
L3U3	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	222.75				1.262	3.351	5.596			
L4U4	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	222.75				1.262	3.351	5.596			
L5U5	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	222.75				1.262	2.804	4.682			
L6U6	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

L0U1	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
U6L7	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
L2U1	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			
L3U2	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.452	2.424			
L4U3	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L3U4	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L4U5	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.452	2.424			
L5U6	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: H 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
L1L2	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
L2L3	Lower-Chord	259.19			42.75	1.18		591.69				1.262	1.841	3.074			
L3L4	Lower-Chord	285.52			41.58	1.18		633.27				1.262	1.947	3.251			
L4L5	Lower-Chord	259.19			42.75	1.18		591.69				1.262	1.841	3.074			
L5L6	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
L6L7	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
U1U2	Upper-Chord	-266.40	-43.94	1.18			-682.00					1.262	2.360	3.941			
U2U3	Upper-Chord	-294.26	-48.12	1.18			-671.60					1.262	1.855	3.099			
U3U4	Upper-Chord	-298.45	-43.82	1.18			-672.28					1.262	2.004	3.346			
U4U5	Upper-Chord	-294.26	-48.12	1.18			-671.60					1.262	1.855	3.099			
U5U6	Upper-Chord	-266.40	-43.94	1.18			-682.00					1.262	2.360	3.941			
L1U1	Vertical	55.27			34.40	1.30		263.34				1.262	1.563	2.610			
L2U2	Vertical	-18.84	-14.42	1.23	19.61	1.28	-223.86	222.75				1.262	3.514	5.868			
L3U3	Vertical	21.95	-5.12	1.26	12.61	1.24	-217.41	222.75				1.262	4.520	7.549			
L4U4	Vertical	21.95	-5.12	1.26	12.61	1.24	-217.41	222.75				1.262	4.520	7.549			
L5U5	Vertical	-18.84	-14.42	1.23	19.61	1.28	-223.86	222.75				1.262	3.514	5.868			
L6U6	Vertical	55.27			34.40	1.30		263.34				1.262	1.563	2.610			
L0U1	Diagonal	-276.50	-45.84	1.18			-726.78					1.262	2.475	4.133			
U6L7	Diagonal	-276.50	-45.84	1.18			-726.78					1.262	2.475	4.133			
L2U1	Diagonal	108.81	-12.25	1.30	24.91	1.20	-162.07	324.39				1.262	2.230	3.725			
L3U2	Diagonal	49.90	-17.97	1.28	21.76	1.22	-202.53	222.75				1.262	2.166	3.617			
L4U3	Diagonal	10.46	-8.54	1.25	12.00	1.25	-81.56	159.39				1.262	3.141	5.245			
L3U4	Diagonal	10.46	-8.54	1.25	12.00	1.25	-81.56	159.39				1.262	3.141	5.245			
L4U5	Diagonal	49.90	-17.97	1.28	21.76	1.22	-202.53	222.75				1.262	2.166	3.617			
L5U6	Diagonal	108.81	-12.25	1.30	24.91	1.20	-162.07	324.39				1.262	2.230	3.725			

Support	LL Reaction (kip)	I.F.

Support	LL Reaction (kip)	I.F.
L0	39.25	1.18
L7	39.25	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L1L2	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L2L3	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L3L4	Lower-Chord	285.52			76.36	1.18		633.27				1.262	1.060	1.770			
L4L5	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L5L6	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L6L7	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
U1U2	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
U2U3	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U3U4	Upper-Chord	-298.45	-80.48	1.18			-672.28					1.262	1.091	1.822			
U4U5	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U5U6	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
L1U1	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			
L2U2	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	222.75				1.262	2.804	4.682			
L3U3	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	222.75				1.262	3.351	5.596			
L4U4	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	222.75				1.262	3.351	5.596			
L5U5	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	222.75				1.262	2.804	4.682			
L6U6	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			
L0U1	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
U6L7	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
L2U1	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			
L3U2	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.452	2.424			
L4U3	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L3U4	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L4U5	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	222.75				1.262	1.452	2.424			
L5U6	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
L1L2	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
L2L3	Lower-Chord	259.19			72.25	1.18		591.69				1.262	1.089	1.818			
L3L4	Lower-Chord	285.52			74.22	1.18		633.27				1.262	1.091	1.821			
L4L5	Lower-Chord	259.19			72.25	1.18		591.69				1.262	1.089	1.818			
L5L6	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
L6L7	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
U1U2	Upper-Chord	-266.40	-74.26	1.18			-682.00					1.262	1.396	2.331			
U2U3	Upper-Chord	-294.26	-80.88	1.18			-671.60					1.262	1.104	1.843			
U3U4	Upper-Chord	-298.45	-78.22	1.18			-672.28					1.262	1.122	1.875			
U4U5	Upper-Chord	-294.26	-80.88	1.18			-671.60					1.262	1.104	1.843			
U5U6	Upper-Chord	-266.40	-74.26	1.18			-682.00					1.262	1.396	2.331			
L1U1	Vertical	55.27			44.00	1.30		263.34				1.262	1.222	2.041			
L2U2	Vertical	-18.84	-23.94	1.23	29.10	1.28	-223.86	222.75				1.262	2.368	3.954			
L3U3	Vertical	21.95	-8.23	1.26	20.24	1.24	-217.41	222.75				1.262	2.815	4.701			
L4U4	Vertical	21.95	-8.23	1.26	20.24	1.24	-217.41	222.75				1.262	2.815	4.701			
L5U5	Vertical	-18.84	-23.94	1.23	29.10	1.28	-223.86	222.75				1.262	2.368	3.954			
L6U6	Vertical	55.27			44.00	1.30		263.34				1.262	1.222	2.041			
L0U1	Diagonal	-276.50	-78.28	1.18			-726.78					1.262	1.449	2.420			
U6L7	Diagonal	-276.50	-78.28	1.18			-726.78					1.262	1.449	2.420			
L2U1	Diagonal	108.81	-14.82	1.30	42.11	1.20	-162.07	324.39				1.262	1.319	2.203			
L3U2	Diagonal	49.90	-26.67	1.28	36.11	1.22	-202.53	222.75				1.262	1.305	2.179			
L4U3	Diagonal	10.46	-13.71	1.25	19.27	1.25	-81.56	159.39				1.262	1.956	3.267			
L3U4	Diagonal	10.46	-13.71	1.25	19.27	1.25	-81.56	159.39				1.262	1.956	3.267			
L4U5	Diagonal	49.90	-26.67	1.28	36.11	1.22	-202.53	222.75				1.262	1.305	2.179			
L5U6	Diagonal	108.81	-14.82	1.30	42.11	1.20	-162.07	324.39				1.262	1.319	2.203			

Support	LL Reaction (kip)	I.F.
L0	67.52	1.18
L7	67.52	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Bridge ID :026-38-03430AGusset-Det
Bridge : NBI=007040 (STT)
StructDef : Nodamage7PanelSteelTruss
User : Bridge
Date : Friday, March 23, 2018 09:19:33
File : RatingResults.XML
Analysis Preference Setting : None

NBI Structure ID :007040
Bridge Alt :
Member : South

Overall Load Factor Rating Summary

Live Load	Live Load Type	Inv Element	Inv RF	Inv Capacity (Ton)	Opr Element	Opr RF	Opr Capacity (Ton)	Legal Opr Element	Legal Opr RF	Legal Opr Capacity (Ton)	Permit Inv Element	Permit Inv RF	Permit Inv Capacity (Ton)	Permit Opr Element	Permit Opr RF	Permit Opr Capacity (Ton)	Impact	Lane
H 20-44 - Lane	Design Lane	L3L4	1.060	21.20	L3L4	1.770	35.40										As Requested	As Requested
H 20-44 - Lane	Design Lane	L3L4	1.060	21.20	L3L4	1.770	35.40										With Impact	Multi-Lane
H 20-44 - Truck	Design Truck	L6U6	1.563	31.26	L6U6	2.610	52.20										As Requested	As Requested
H 20-44 - Truck	Design Truck	L6U6	1.563	31.26	L6U6	2.610	52.20										With Impact	Multi-Lane
HS 20-44 - Lane	Design Lane	L3L4	1.060	38.16	L3L4	1.770	63.73										As Requested	As Requested
HS 20-44 - Lane	Design Lane	L3L4	1.060	38.16	L3L4	1.770	63.73										With Impact	Multi-Lane
HS 20-44 - Truck	Design Truck	L2L3	1.089	39.20	L2L3	1.818	65.46										As Requested	As Requested
HS 20-44 - Truck	Design Truck	L2L3	1.089	39.20	L2L3	1.818	65.46										With Impact	Multi-Lane

Live Load: H 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force Comp. (kip)	IF	Tens. (kip)	IF	Capacity Comp. (kip)	Capacity Tens. (kip)	Adj Veh Demand Comp. (kip)	Adj Veh Demand Tens. (kip)	One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
L0L1	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L1L2	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L2L3	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L3L4	Lower-Chord	285.52			76.36	1.18		633.27				1.262	1.060	1.770			
L4L5	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L5L6	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L6L7	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
U1U2	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
U2U3	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U3U4	Upper-Chord	-298.45	-80.48	1.18			-672.28					1.262	1.091	1.822			
U4U5	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U5U6	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
L1U1	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			
L2U2	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	219.78				1.262	2.804	4.682			
L3U3	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	219.78				1.262	3.300	5.510			
L4U4	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	219.78				1.262	3.300	5.510			
L5U5	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	219.78				1.262	2.804	4.682			
L6U6	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

L0U1	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
U6L7	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
L2U1	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			
L3U2	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.424	2.379			
L4U3	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L3U4	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L4U5	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.424	2.379			
L5U6	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: H 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
L1L2	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
L2L3	Lower-Chord	259.19			42.75	1.18		591.69				1.262	1.841	3.074			
L3L4	Lower-Chord	285.52			41.58	1.18		633.27				1.262	1.947	3.251			
L4L5	Lower-Chord	259.19			42.75	1.18		591.69				1.262	1.841	3.074			
L5L6	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
L6L7	Lower-Chord	186.00			30.84	1.18		442.53				1.262	2.010	3.357			
U1U2	Upper-Chord	-266.40	-43.94	1.18			-682.00					1.262	2.360	3.941			
U2U3	Upper-Chord	-294.26	-48.12	1.18			-671.60					1.262	1.855	3.099			
U3U4	Upper-Chord	-298.45	-43.82	1.18			-672.28					1.262	2.004	3.346			
U4U5	Upper-Chord	-294.26	-48.12	1.18			-671.60					1.262	1.855	3.099			
U5U6	Upper-Chord	-266.40	-43.94	1.18			-682.00					1.262	2.360	3.941			
L1U1	Vertical	55.27			34.40	1.30		263.34				1.262	1.563	2.610			
L2U2	Vertical	-18.84	-14.42	1.23	19.61	1.28	-223.86	219.78				1.262	3.470	5.796			
L3U3	Vertical	21.95	-5.12	1.26	12.61	1.24	-217.41	219.78				1.262	4.451	7.434			
L4U4	Vertical	21.95	-5.12	1.26	12.61	1.24	-217.41	219.78				1.262	4.451	7.434			
L5U5	Vertical	-18.84	-14.42	1.23	19.61	1.28	-223.86	219.78				1.262	3.470	5.796			
L6U6	Vertical	55.27			34.40	1.30		263.34				1.262	1.563	2.610			
L0U1	Diagonal	-276.50	-45.84	1.18			-726.78					1.262	2.475	4.133			
U6L7	Diagonal	-276.50	-45.84	1.18			-726.78					1.262	2.475	4.133			
L2U1	Diagonal	108.81	-12.25	1.30	24.91	1.20	-162.07	324.39				1.262	2.230	3.725			
L3U2	Diagonal	49.90	-17.97	1.28	21.76	1.22	-202.53	219.78				1.262	2.125	3.549			
L4U3	Diagonal	10.46	-8.54	1.25	12.00	1.25	-81.56	159.39				1.262	3.141	5.245			
L3U4	Diagonal	10.46	-8.54	1.25	12.00	1.25	-81.56	159.39				1.262	3.141	5.245			
L4U5	Diagonal	49.90	-17.97	1.28	21.76	1.22	-202.53	219.78				1.262	2.125	3.549			
L5U6	Diagonal	108.81	-12.25	1.30	24.91	1.20	-162.07	324.39				1.262	2.230	3.725			

Support	LL Reaction (kip)	I.F.

Support	LL Reaction (kip)	I.F.
L0	39.25	1.18
L7	39.25	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Lane (Design Lane)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L1L2	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L2L3	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L3L4	Lower-Chord	285.52			76.36	1.18		633.27				1.262	1.060	1.770			
L4L5	Lower-Chord	259.19			72.37	1.18		591.69				1.262	1.087	1.815			
L5L6	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
L6L7	Lower-Chord	186.00			52.00	1.18		442.53				1.262	1.192	1.991			
U1U2	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
U2U3	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U3U4	Upper-Chord	-298.45	-80.48	1.18			-672.28					1.262	1.091	1.822			
U4U5	Upper-Chord	-294.26	-82.04	1.18			-671.60					1.262	1.088	1.817			
U5U6	Upper-Chord	-266.40	-74.39	1.18			-682.00					1.262	1.394	2.327			
L1U1	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			
L2U2	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	219.78				1.262	2.804	4.682			
L3U3	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	219.78				1.262	3.300	5.510			
L4U4	Vertical	21.95	-6.49	1.26	17.01	1.24	-217.41	219.78				1.262	3.300	5.510			
L5U5	Vertical	-18.84	-21.17	1.23	22.76	1.28	-223.86	219.78				1.262	2.804	4.682			
L6U6	Vertical	55.27			38.80	1.30		263.34				1.262	1.386	2.314			
L0U1	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
U6L7	Diagonal	-276.50	-86.67	1.18			-726.78					1.262	1.309	2.186			
L2U1	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			
L3U2	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.424	2.379			
L4U3	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L3U4	Diagonal	10.46	-11.02	1.25	15.89	1.25	-81.56	159.39				1.262	2.432	4.062			
L4U5	Diagonal	49.90	-20.41	1.28	32.46	1.22	-202.53	219.78				1.262	1.424	2.379			
L5U6	Diagonal	108.81	-12.36	1.30	41.74	1.20	-162.07	324.39				1.262	1.331	2.223			

Support	LL Reaction (kip)	I.F.
L0	74.00	1.18
L7	74.00	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action

Live Load: HS 20-44 - Truck (Design Truck)

Detailed Truss Member Rating Results

LL Scale Factor = 1.00
Adjacent Vehicle LL Factor = 0.00
Inventory:
A1 = 1.30, A2 = 2.17
Operating:
A1 = 1.30, A2 = 1.30
Note: Rating factor is outputted as 99.00 when it is greater than 99

Member	Truss Element	DL Force (kip)	LL Force				Capacity		Adj Veh Demand		One Lane LLDF	Multi Lane LLDF	Inv RF	Opr RF	Legal Opr RF	Permit Inv RF	Permit Opr RF
			Comp. (kip)	IF	Tens. (kip)	IF	Comp. (kip)	Tens. (kip)	Comp. (kip)	Tens. (kip)							
L0L1	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
L1L2	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
L2L3	Lower-Chord	259.19			72.25	1.18		591.69				1.262	1.089	1.818			
L3L4	Lower-Chord	285.52			74.22	1.18		633.27				1.262	1.091	1.821			
L4L5	Lower-Chord	259.19			72.25	1.18		591.69				1.262	1.089	1.818			
L5L6	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
L6L7	Lower-Chord	186.00			52.65	1.18		442.53				1.262	1.177	1.966			
U1U2	Upper-Chord	-266.40	-74.26	1.18			-682.00					1.262	1.396	2.331			
U2U3	Upper-Chord	-294.26	-80.88	1.18			-671.60					1.262	1.104	1.843			
U3U4	Upper-Chord	-298.45	-78.22	1.18			-672.28					1.262	1.122	1.875			
U4U5	Upper-Chord	-294.26	-80.88	1.18			-671.60					1.262	1.104	1.843			
U5U6	Upper-Chord	-266.40	-74.26	1.18			-682.00					1.262	1.396	2.331			
L1U1	Vertical	55.27			44.00	1.30		263.34				1.262	1.222	2.041			
L2U2	Vertical	-18.84	-23.94	1.23	29.10	1.28	-223.86	219.78				1.262	2.339	3.906			
L3U3	Vertical	21.95	-8.23	1.26	20.24	1.24	-217.41	219.78				1.262	2.772	4.630			
L4U4	Vertical	21.95	-8.23	1.26	20.24	1.24	-217.41	219.78				1.262	2.772	4.630			
L5U5	Vertical	-18.84	-23.94	1.23	29.10	1.28	-223.86	219.78				1.262	2.339	3.906			
L6U6	Vertical	55.27			44.00	1.30		263.34				1.262	1.222	2.041			
L0U1	Diagonal	-276.50	-78.28	1.18			-726.78					1.262	1.449	2.420			
U6L7	Diagonal	-276.50	-78.28	1.18			-726.78					1.262	1.449	2.420			
L2U1	Diagonal	108.81	-14.82	1.30	42.11	1.20	-162.07	324.39				1.262	1.319	2.203			
L3U2	Diagonal	49.90	-26.67	1.28	36.11	1.22	-202.53	219.78				1.262	1.280	2.138			
L4U3	Diagonal	10.46	-13.71	1.25	19.27	1.25	-81.56	159.39				1.262	1.956	3.267			
L3U4	Diagonal	10.46	-13.71	1.25	19.27	1.25	-81.56	159.39				1.262	1.956	3.267			
L4U5	Diagonal	49.90	-26.67	1.28	36.11	1.22	-202.53	219.78				1.262	1.280	2.138			
L5U6	Diagonal	108.81	-14.82	1.30	42.11	1.20	-162.07	324.39				1.262	1.319	2.203			

Support	LL Reaction (kip)	I.F.
L0	67.52	1.18
L7	67.52	1.18

LLDF	Single Lane	Multi Lane
Force		1.262
Deflection		2.000

Panel Point Shear Action